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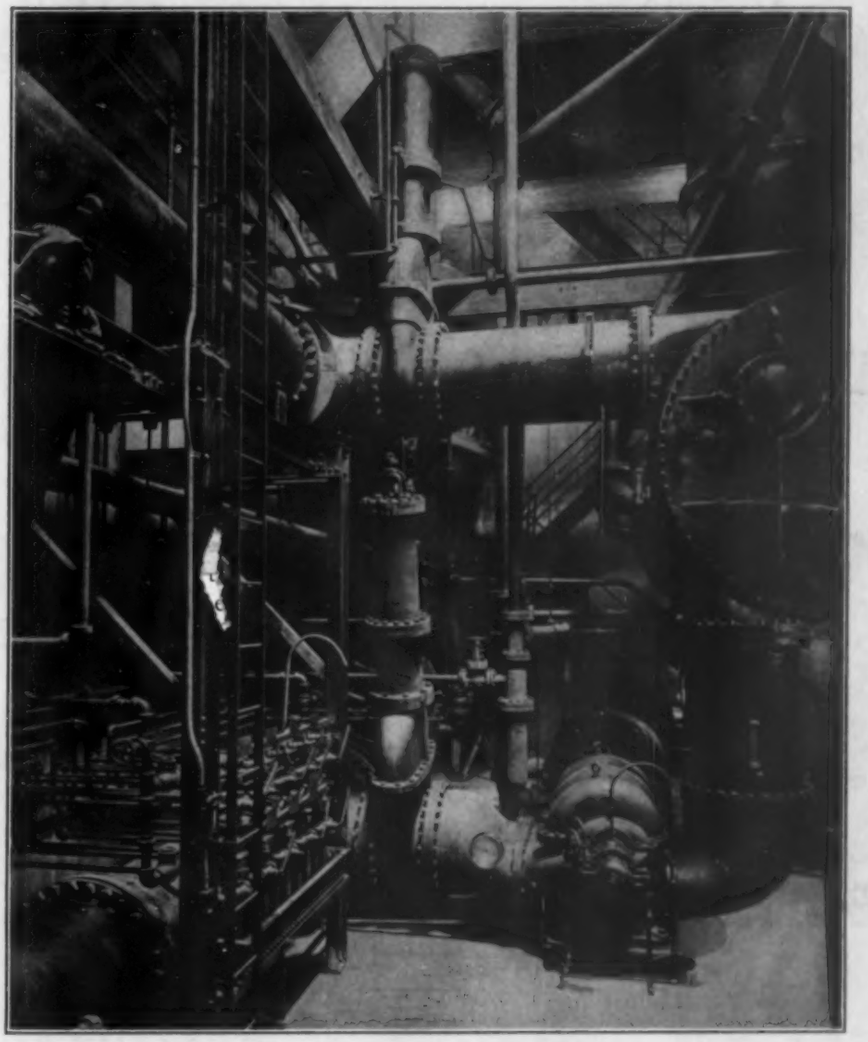

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THE IRON TRADE REVIEW

Vol. LXI Cleveland, October 11, 1917 *No. 15*

Delayed Prices Hold Back Market

Further Conference Between Producers and War Industries Board Expected to Clear Up Situation—Government Demands Exceed All Estimates and Orders of Private Buyers Suffer—Tremendous Shell Tonnage Wanted

WASHINGTON still is to give the word that will clear up the uncertainty now paralyzing the iron and steel market. Another week has failed to bring forth the announcements from the government which are needed to round out the plan of federal price control. The delay in this vital matter is suggestive of new obstacles having been encountered in harmonizing the ramified elements present in the situation. Much importance consequently is being given to further conferences now being held at Washington between the general iron and steel committee and the war industries board. In the meantime, the industry is making such adjustments to the new price level as definite conditions will permit. In finished steel, buyers still find it practically impossible to obtain material at the fixed schedule. One eastern mill, however, has opened its books for shape business at 3c, Pittsburgh. Several producers, particularly in plates, continue to sell at open market prices without regard to the agreed maximum, claiming their semifinished costs compel them to do so.

War Buying is Enormous

Government and allied tonnage now is flowing in upon the mills in a volume that exceeds all previous expectation. These war demands are expanding so fast it is becoming more and more uncertain when old orders for the general trade are to be filled, not to speak of new ones being accepted. Certain mills are turning over 75 to 80 per cent of their output into war material. Others are furnishing an even larger proportion. The way commercial business previously booked is being superseded by war demands indicates that some of the largest makers will not be able to clear their present obligations short of Jan. 1, 1919.

The government now is taking up the purchase of tremendous quantities of 6, 8 and 9-inch shells. For this purpose, 1,500,000 tons of steel, it is estimated, will be required. On one size, 13,000,000 shells are wanted. An order for 450 standardized boilers distributed for the emergency fleet is interesting as showing the arrangement under which the government is buying some of its needs. The latter will supply the 12,000 to 14,000 tons of steel required and the shops will furnish the labor for manufacturing. A 7000-ton plate order for a lake yard has been allotted, as well as 8600 tons of plate circles. Electric steel needs of the government now in the market are placed at 15,000 to 20,000 tons. The steel requirements for the 150 destroyers which have just been contracted for will be heavy. The Submarine Boat Corp. is out to place 69,000 tons of fabricated steel for 50 merchant vessels for the emergency fleet.

More Iron Being Sold

Selling of pig iron at the new fixed prices has been growing as inquiry has become more insistent. A Virginia maker has disposed of 9000 tons of foundry iron for delivery this year at $33, furnace, for No. 2X, and at $32.75 for No. 2 plain. Where quotations of $33 on foundry iron have been made by producers, they invariably have been based at the furnace and apply to a 1.75 to 2.25 per cent silicon content. Foundry iron sales at the new price for delivery in the first quarter also are reported from the east. A round lot of copper-bearing low phosphorus iron went at $56.50, eastern furnace, a provisional price, and 5000 tons of valley basic for this year was done at $33, furnace. A tentative sale of 1000 tons of valley bessemer at $36.30, furnace, also was closed. The new schedule of grade differentials in pig iron for recommendation to the government upon which producers have been working has been arranged tentatively, but it awaits federal announcement and adoption.

Steel Output Falling Down

Steel production in the country is running less than had been anticipated, according to the newly undertaken compilation of official monthly statistics. These indicate present ingot production is at the rate of 42,260,000 tons a year, against 42,773,680 tons last year, when the capacity was considerably less.

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EDITORIAL

Congress Learns a Lesson

CERTAIN congressmen who have been conspicuous for their severe but indefinite criticism of business men have learned from personal experiences during the past few days a lesson which their sense of fair play had never taught them. The $50,000 with which Von Bernstorff cheerfully hoped to win congress over to a German viewpoint might prove to be money well spent, if the present exposure of his plans teaches a few congressmen the iniquity of charging unnamed men with improper practices.

When one of their own members arose in congress and with careful indefiniteness accused certain unnamed congressmen of having benefited from this German money, our worthy legislators took offense at such tactics. Senator Kenyon, who has never been heralded as a friend of "big business", pointed out solemnly how such reckless charges placed upon all congressmen an odium which they would be unable to remove. Representative Norton eloquently pointed out that he knew "of no greater crime that could be done this country or its people, no greater injury that could be done to this form of government than for a members of this body to charge against his fellow members falsely that they have been corrupt. * * * If he go down on his marrow bones in front of this house or could undo the evil he has done, no suffering and no pain enough could be dealt out to that kind of a character. If I had a suspicion against the honesty or integrity of any man I would not insinuate it. I would investigate and find out if it were true."

The solicitude felt by these congressmen for the reputations of themselves and their fellow members is largely unnecessary, for the country at large was not foolish enough to take the reckless charges seriously. One reason for this is found in the lessons in disbelief in such vague and wholesale incriminations which congress itself has taught by its carping attitude toward the leaders of the country's industries—safely masked under such general terms as "Wall street", "money trust", "shipping combine", *ad infinitum*.

If congress can be cured of this practice by a dose of its own medicine, Von Bernstorff's labors will have had one result which it will be pleasant to recall.

What the Railroads Are Doing

THE railroad's war board announced a few days ago that a comparison of the freight service rendered by the carriers two years ago and today shows a gain in that short period equal to the freight traffic of Great Britain, France, Russia, Germany and Austria combined. During the first four months of its existence, the board moved 113,420 empty freight cars into districts where they were most needed, saved 52,000 cars by pooling lake coal and lake ore, saved 113,000 cars by pooling tidewater coal. Cement cars are now carrying 77,000 pounds against 70,000 pounds last year. Tin plate cars, which carried nearly 92 per cent of their marked capacity on June 27, are now being loaded to carry 98.6 per cent. In July, 132 railroads transported 207,429 more loaded cars from the coal mines than for the same month last year, an increase of 31.5 per cent, or 10,316,990 tons. At the same time the carriers were moving 1,000,000 men from 5000 different points to the 32 training camps of the national army and national guard. The railroads apparently have met the abnormal demands of war before some other industries have realized that hostilities have opened.

War Profiteering and the Farmer

A RECENT compilation places the excess profits of the farmers for the past year at more than $6,500,000,000. This figure is reached by taking the average return to the farmers for their 1911, 1912 and 1913 wheat, corn, oats and cotton, and determining the excess which they will receive for the 1917 crop. In corn, for instance, the average production during those three years was 2,701,074,000 bushels, sold at an average price of $0.599, and yielding $1,592,601,000. This year's corn crop of 3,191,000,000 bushels, taken at the Aug. 1 quotation of $1.966, will yield $6,273,506,000, an excess of $4,680,905,000. Congress must have had the farmers rather than the steel magnates in mind when condemning war profiteering.

Co-operation Must Be Given

THE government has undertaken a tremendous task in connection with its extensive price-fixing program. It is to be sincerely hoped that all of those concerned one way or the other will co-operate heartily in an earnest effort to make the vast undertaking a success. Grave doubts are entertained in various directions that it can be worked out as planned. Precedent taken from the experience of other belligerent nations has created these misgivings.

One thing is sure, however. Those whose products are controlled either by voluntary agreement or by law, can make the efforts of the government successful, regardless of precedent, if they co-operate fully

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EDITORIAL

with it. Those who do not are as much slackers as the men who avoid the military service their citizenship calls for, and as such are not contributing their proper effort against the common enemy. It is as clear as daylight that if co-operation is not forthcoming under voluntary methods from those whose support is all-essential, in the great enterprise upon which the Nation has embarked, such as the iron and steel industry, the means will be found to compel it.

Tangible Service by Technical Societies

ONE of the encouraging signs of the times is the disposition of engineering societies to arrange their meetings so as to break away from the narrow round of technical discussion in order to attack some of the broader problems of national development now pressing for solution. This tendency to consider fundamentals rather than the details of engineering practice will result not only in more effective co-ordination of our productive activities toward winning the war, but will also have a leavening effect on the organizations concerned and the engineering fraternity as a whole. In the past, engineers as a class have not occupied the position they should in public affairs because of their tendency to confine their thoughts and actions within narrow technical limits. The war, however, has driven many engineers out of the professional rut.

The new order of things is evident in the activities of a score of engineering societies. It was particularly noticeable in the proceedings at the recent convention of the American Foundrymen's association in Boston, where a large amount of time was devoted to the consideration of fundamental problems of national welfare in the solution of which foundrymen can be effective. In a similar manner, the American Electrochemical society in its recent convention at Pittsburgh took up the work of the electrochemist from the standpoint of national service. A similar tendency was evident in the proceedings of the American Institute of Mining Engineers, which met in St. Louis Oct. 8-12.

All are agreed that to win the war, there must be conservation of resources, including food, fuels and supplies of all kinds; higher efficiency in industry and transportation; unlimited production of munitions and appliances of war; willing co-operation on the part of every citizen, regardless of his status in life; and the greatest possible development of American inventive and productive talent. The solution of these problems will form the basis of a special session at the A. S. M. E. meeting. This session will last all day Thursday, Dec. 6. It will be opened by Ira M. Hollis, president of the American Society of Mechanical Engineers, who will speak on universal public service in peace and war. He will be followed by other speakers who will deal with the following topics: The agricultural machinery problem, the machinery of food production, general transportation, motor transportation, the aircraft problem, engineering research, and merchant marine problems.

In brief, the time has passed when technical men, citizens of a country at war, can sit in a convention merely to discuss the details of engineering practice. Their thoughts are on the great problems of the war and the service they can render their country.

1917 Steel Ingot Production

STEEL ingot production in 1917, according to an estimate which the American Iron and Steel institute has prepared, will only be 42,600,000 tons. This estimate is based upon the monthly production records which 29 steel companies, making 88.14 per cent of the country's output, are now furnishing that organization. This year's output, in the face of war needs, would thus be less than in 1916, when 42,773,680 tons were produced.

The estimate sets a figure well below those previously made. A production at least three or four million tons greater had been predicted. On the basis of the institute's estimate, the monthly average steel production is 3,500,000 tons. Only a few day ago, the government's steel needs for the next two months were set at 7,000,000 tons—equal to 100 per cent of the estimated production in the next 60 days.

The country's steelmaking capacity is far above the output indicated and any factors contributing to the constriction of maximum output should be promptly corrected.

The institute's actual figures on production confirm the general belief that the steel ingot output has dropped somewhat during recent months in corresponding proportion to the slight but consistent decline in pig iron production. The companies contributing to the institute's records showed an average output during the first six months of the year of 3,100,000 tons, but their September production was only 2,900,000 tons, a drop of 3.5 per cent. This country produces 50 per cent of the world's steel output—a factor of decisive importance in winning the war. Rapid and effective mobilization of this capacity, however, is proving one of the country's biggest war problems.

Iron and Steel Prices

Corrected to Wednesday Noon

SCRAP, WAREHOUSE AND IRON ORE PRICES ON PAGE 802

PIG IRON

(Delivery this year.)

Bessemer valley	$36.30
Bessemer, Pittsburgh	37.25
Basic, Pittsburgh	33.95
Basic, eastern Pa.	33.00
Basic, Buffalo	33.00
Malleable, Pittsburgh	34.45
Malleable, Chicago	33.50
*Malleable, Philadelphia	
*Malleable, Buffalo	
*No. 1X, Phila.	
No. 2 foundry, Pittsburgh	33.95
No. 2 foundry, Cleveland	33.95
No. 2 foundry, Ironton	33.00
*No. 1 foundry, Chicago	
No. 2 foundry, Chicago	33.00
No. 2X foundry, Phila.	34.00 to 34.50
No. 2X foundry, N. J. tide.	34.25 to 34.50
No. 2X foundry, Buffalo	33.00
*No. 2 plain, Philadelphia	
*No. 2 plain, N. J. tide	
*No. 2 plain, Buffalo	
*No. 2 southern, Birmingham	
*No. 2 southern, Cincinnati	
*No. 2 southern, Chicago	
*No. 2 southern, Phila. del.	
*No. 2 southern, Cleveland	
*No. 2 southern, N. Y.	
*No. 2 southern, Boston	
*No. 2 south. interior, N. E.	
*No. 2 southern, St. Louis	
*Virginia, No. 2X, furnace	
*Virginia, No. 2X, Phila.	
*Virginia, No. 2X, Jersey City	
*Virginia, No. 2X, Boston	
*Gray forge, eastern Pa.	
Gray forge, Pittsburgh	32.95
*Gray forge, Birmingham	
*Silveries, 8 per cent, furnace	
*Silveries, 8 per cent, Chgo.	
*Low phos. standard, Phila.	
*Low phos. Lebanon furnace	
*Low phos., Pittsburgh	
*Charcoal, Superior, Chicago	
*Charcoal, Superior, Buffalo	
*Charcoal, Birmingham	

COKE

(At the ovens.)

Connellsville furnace	$6.00
*Connellsville foundry, contr.	
*Connellsville foundry	
*Wise county furnace, contr.	
*Wise county foundry, contr.	
*Pocahontas furnace, contr.	
*New River foundry, contr.	
*New River furnace, contr.	

FERRO ALLOYS

Ferromanganese, prompt	$300.00
Ferromanganese, last quar.	300.00
Spiegeleisen, 20 per cent furnace, remainder of year	75.00
Ferrosilicon, 50 per cent, Pitts.	170.00 to 180.00
Ferrosilicon, 50 per cent, Pitts., 1st quarter	130.00 to 140.00
Bessemer ferrosilicon, 9 per cent	$94.00
Bessemer ferrosilicon, 10 per cent	95.00
Bessemer ferrosilicon, 11 per cent	97.50
Bessemer ferrosilicon, 12 per cent	100.00
Bessemer ferrosilicon, 13 per cent	105.00

Ferrosilicon prices at Ashland, Ky., Jackson and New Straitsville, O., furnaces.

SEMI-FINISHED MATERIAL

BILLETS

Open hearth, Pittsburgh	$70.00
Open hearth, Philadelphia	
Open hearth, Youngstown	90.00
Bessemer, Pittsburgh	70.00
Bessemer, Youngstown	80.00 to 85.00
Forging, Pittsburgh	125.00
Forging, Philadelphia	
Forging, Chicago	125.00

SHEET BARS

Open hearth, Pittsburgh	$80.00
Open hearth, Youngstown	90.00
Open hearth, Cleveland	90.00 to 95.00
Bessemer, Pittsburgh	80.00
Bessemer, Youngstown	90.00

WIRE RODS, MUCK BAR, SKELP

Wire rods, Pittsburgh	$90.00
Muck bar, Pittsburgh	85.00 to 90.00
Grooved skelp, Pitts., nom.	4.00c to 4.50c
Sheared skelp, Pitts., nom.	4.50c to 5.00c

*Not determined.

SHAPES, PLATES AND BARS

Structural shapes, Pitts.	3.00c
Structural shapes, Phila.	3.185c
Structural shapes, N. Y.	3.195c
Structural shapes, Chicago.	3.00c
Tank plates, Chicago	3.25c
Tank plates, Pittsburgh	3.25c
Tank plates, Philadelphia.	3.435c
Tank plates, New York	3.445c
Bars, soft steel, Pittsburgh	2.90c
Bars, soft steel, Chicago	2.90c
Bars, soft steel, New York	3.195c
Bars, soft steel, Phila.	3.185c
Cotton ties, Pitts., Sept.	$2.12
Bar iron, Chicago	4.50c to 5.00c
Bar iron, Philadelphia	4.685c to 5.185c
Bar iron, Cleveland	4.50c to 5.00c
Bar iron, New York	4.695c to 5.195c
Bar iron, Pittsburgh	5.25c
Hard steel bars, Chicago.	4.25c to 4.50c

RAILS, TRACK MATERIAL

Angle bars, Pittsburgh, base	3.75c to 4.00c
Angle bars, Chicago, base	3.25c to 4.00c
Standard bessemer rails, mill.	$38.00
Stand. open hearth rails, mill	40.00
Light rails, 25 to 45 lbs., Chic.	70.00
Light rails, 25 to 45 lbs., Pitts.	75.00 to 85.00
Relayers, standard, mill	38.00 to 40.00
Relayers, light, Chicago	60.00
Relaying rails, light, St. L.	62.00 to 65.00
Spikes, railroad, Pittsburgh	6.50c to 7.00c
Spikes, railroad, Chicago	5.00c to 5.25c
Track bolts, Pittsburgh	5.50c to 8.00c
Track bolts, Chicago	5.25c to 6.50c
Tie plates, Chicago	$70.00 to 75.00

WIRE PRODUCTS

(Prices of independent makers.)

(To jobbers; retailers 5 cents more.)

Wire nails, Pittsburgh	$4.00
Coated nails, Pittsburgh	4.00
Plain wire, Pittsburgh	3.95
Galvanized wire, Pittsburgh	4.65
Polished staples, Pittsburgh	4.15
Galvanized staples, Pittsburgh.	4.85
Barb wire, painted, Pittsburgh.	4.15
Barb wire, galvanized, Pitts.	4.85
Cut nails, Pittsburgh	4.50

CHAIN, PILING, STRIP STEEL

Chain, ⅜ in. proof coil, Pitts.	9.00c
Sheet piling, base, Pittsburgh	4.00c to 5.00c

Cold rolled strip steel, hard coils, 1½ inches and wider by 0.100 inch and heavier, base per 100 pounds, 9.00c to 9.50c.

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SHEETS

(In cents per pound.)

SHEET MILL BLACK.

No. 28, open hearth, Pitts.	8.00c to 9.00c
No. 28, bessemer, Pitts.	8.50c to 9.50c
No. 28, open hearth, Chic.	8.959c to 9.205c

TIN MILL, BLACK

No. 28, open hearth, Pitts.	8.50c to 9.50c
No. 28, bessemer, Pitts.	8.00c to 9.50c

GALVANIZED

No. 28, open hearth, Pitts.	9.25c to 11.00c
No. 28, bessemer, Pitts.	9.25c to 11.00c
No. 28, open hearth, Chic.	10.205c to 10.705c

BLUE ANNEALED

No. 10, open hearth, Pitts.	8.50c to 9.00c
No. 10, bessemer, Pitts.	8.50c to 9.00c
No. 10, open hearth, Chic.	8.705c to 8.955c
No. 10, open hearth, Phila.	8.185c to 8.685c

TIN PLATE

(Per 100 lb. box.)

Tin plate, coke base, nom. $10.00 to 15.00

IRON AND STEEL PIPE

(Prices adopted June 18, 1917.)

Steel

Diameter in inches.	Black. Per cent off.	Galv. Per cent off.
¼ to 3, butt	42	28½

Iron.

(Prices adopted June 30, 1917.)

Diameter in inches.	Black. Per cent off.	Galv. Per cent off.
¼ to 1½, butt	33	17

BOILER TUBES

(Price adopted April 2, 1917.)

Steel, 3½ to 4½ inches, l. c. l.	34
Iron, 3½ to 4½ inches, l. c. l.	28

CAST IRON WATER PIPE

(Class B Pipe.)

Four-inch, Chicago	68.00 to 68.50
Six-inch and over, Chicago	65.00 to 65.50
Four-inch, New York	53.50
Six-inch and over, New York	50.50
Four-inch, Birmingham	48.00
Six-in. and over, Birmingham	43.00

Class A pipe is $1 higher than Class B.

HOOPS, BANDS, SHAFTING

Hoops, Pittsburgh	6.00c to 6.50c
Bands, Pittsburgh	6.00c to 6.50c
Shafting, Pittsburgh, carloads	5 off to list

RIVETS

Structural rivets, Pittsburgh.	5.25c
Boiler rivets, Pittsburgh	5.35c
Rivets ⅞ in. and smaller, Pitts.	40 off

NUTS AND BOLTS

(Delivered within 20-cent freight radius.)

CARRIAGE BOLTS

(⅜ x 6 inches, smaller and shorter.)

Rolled thread	40 off
Cut thread	35 and 2½ off
Larger or longer	25 off

MACHINE BOLTS

(⅜ x 4 inches, hot pressed nuts.)

Rolled thread	40 and 10 off
Cut thread	40
Larger and longer	30
Cold pressed, semi-finished, hexagon nuts	50 and 10
Gimlet and cone point lag screws	45

NUTS

Hot pressed, square, blank	1.70 off
Hot pressed, square, tapped	1.50 off
Cold pressed, square, blank	1.25 off
Cold pressed, square, tapped	1.00 off
Hot pressed, hexagon, blank	1.50 off
Hot pressed, hexagon, tapped	1.30 off
Cold pressed, hexagon, blank	1.25 off
Cold pressed, hexagon, tapped	1.00 off

Prices Present and Past

(Yesterday, a month ago, three months ago and a year ago.)

Quotations on leading products October 10, average for September, 1917, average for July, 1917, and average for October, 1916. Prices are those ruling in the largest percentage of sales at the dates named

	Prices Oct. 10, 1917.	Average prices Sept., 1917.	July, 1917.	Oct., 1916.
Bessemer pig iron, Pittsburgh	$37.25	$48.28	$57.95	$24.33
Basic pig iron, Pittsburgh	33.95	44.45	53.20	20.83
No. 2 Foundry pig iron, Pitts.	33.95	48.95	55.95	21.08
No. 2 Foundry pig iron, Chic.	33.00	49.50	55.00	19.15
Lake Superior Charcoal, Chicago	.....*	59.50	59.50	20.35
Malleable, Chicago	33.50	49.50	55.00	19.50
Southern, No. 2, Birmingham	.....*	43.50	46.00	15.13
Southern Ohio No. 2, Ironton	33.00	49.50	54.25	19.38
Basic, eastern Pa.	.....*	49.50	50.75	20.75
No. 2X Virginia, furnace	33.00	50.75	52.25	18.50
No. 2X foundry, Philadelphia	33.75	52.25	54.25	20.75
Ferro mang., delivered	337.50	378.00	430.00	162.00
Bessemer billets, Pittsburgh	70.00	73.75	100.00	45.75
Bessemer sheet bars, Pittsburgh	80.00	82.50	105.00	45.75
Open hearth sheet bars, Pitts.	80.00	82.50	105.00	45.75
Open hearth billets, Pittsburgh	70.00	73.75	100.00	45.75
Steel bars, Pittsburgh	2.90	3.725	3.875	2.60
Steel bars, Chicago	2.90	4.10	4.50	2.80
Iron bars, Philadelphia	4.935	4.935	4.759	2.659
Iron bars, Cleveland, local del'y	4.60	4.50	4.50	2.55

	Prices Oct. 10, 1917.	Average prices Sept., 1917.	July, 1917.	Oct., 1916.
Iron bars, Chicago mill	$4.50	$4.50	$4.50	$2.35
Beams, Chicago	3.00	4.46	5.88	2.80
Beams, Pittsburgh	3.00	3.75	4.50	2.70
Beams, Philadelphia	3.185	4.435	4.909	2.859
Tank plates, Pittsburgh	3.25	6.81	5.63	3.00
Tank plates, Chicago	3.25	7.33	9.64	3.19
Tank plates, Philadelphia	3.435	7.75	10.159	3.309
Sheets, blk., No. 28, Pittsburgh	9.00	8.75	9.00	3.23
Sheets, blue anld., No. 10, Pitts.	8.50	8.50	8.50	3.13
Sheets, galv., No. 28, Pittsburgh	10.25	9.69	10.25	4.45
Wire nails, Pittsburgh	4.00	4.00	4.00	2.63
Connellsville fur. coke	6.00	9.63	9.63	3.38
Connellsville fdy. coke, contract	12.50*	12.50	12.38	4.88
Heavy melting steel, Pittsburgh	32.00	35.50	40.25	17.87
Heavy melting steel, eastern Pa.	26.00	31.25	37.00	15.50
Heavy melting steel, Chicago	31.00	32.60	35.50	16.50
No. 1 wrought, eastern Pa.	44.50	44.50	54.00	22.00
No. 1 wrought, Chicago	36.00	36.23	39.13	17.50
Rerolling rails, Chicago	40.00	41.25	46.25	18.75
Car wheels, Chicago	31.00	31.00	36.75	12.25

*Not determined.

(For Additional Prices See Page 802)

Iron Tonnages Sold at New Prices

Virginia Makers Book 9000 Tons at $33 and $32.75, Furnace—Low Phosphorus Lot Goes at $56.50, Furnace and 5000 Tons of Basic at $33—Tentative Differentials Recommended to Government By Producers

Philadelphia, Oct. 8.—Prices to be established by the government on the various grades of pig iron have been recommended by eastern Pennsylvania and Virginia makers. On this suggested basis, eastern Pennsylvania and Virginia furnaces would be entitled to receive $33.50 for No. 2X and $33 for No. 2 plain. Until a full schedule of prices, however, is announced by the President, it is unlikely that eastern furnaces definitely will conclude sales for any grades at higher than $33, the only price which so far has been officially established. Sales of pig iron this week totaled about 12,000 tons, of which all but a few hundred tons was foundry. The principal seller was a Virginia maker who in a campaign which lasted 48 hours disposed of the entire unsold portion of his 1917 output. This interest sold about 9000 tons at $33, furnace, including 1000 tons of No. 2 plain to a Massachusetts machinery builder and 1000 tons of No. 2X to a Newark, N. J. melter. All this iron went at $33, furnace, for No. 2X and $32.75 for No. 2 plain. Transactions of the week included the first sale at the new level for next year's shipment. An eastern Pennsylvania maker sold 1000 tons of No. 2X and No. 1X for the remainder of this year and first quarter of next. As a rule the disposition among furnaces is to refrain from taking next year's business at the present price. Sales of the week include a round tonnage of copper-bearing low phosphorus at $56.50, furnace, the price being based upon a $55 base for a fixed analysis. A moderate tonnage of off-bessemer sold at $36.30, furnace. Current inquiry involves fully 10,000 tons of foundry, mostly, however, for next year. Inquiries also are out for round tonnages of low phosphorus and basic.

More Tonnages Are Sold

Pittsburgh, Oct. 9.—That pig iron producers have accepted the government price-fixing program in good faith is evidenced by the transactions that have taken place during the past week. While for the most part they involve small lots, in the aggregate they represent a sizable tonnage and in all cases the sales were made with the government figure of $33, furnace, for basic and No. 2 foundry used as the basis. Contracts made call for delivery for the last quarter and the first half. One sale reported involved 1000 tons of bessemer iron by a valley producer to a consumer in Detroit. It was made at the tentative price of $36.30, furnace, for that portion of the tonnage to be delivered during the remainder of the year, while the price for delivery next January was left to be determined by the government. The same producer bought 5000 tons of basic iron at $33, furnace, the government figure. Small tonnages of different foundry grades also have been sold for prompt and first quarter delivery. Differentials on the various grades are expected to be announced this week by the government. It is believed that all government figures are to be f.o.b. furnace. Once this question and also the determination of differentials have been settled upon, the market is expected to take on renewed activity. While furnaces are well booked for the remainder of the year, producers are finding available tonnages for their regular trade and are not hesitating about selling it for both prompt and future deliv-

ery at government figures. It is expected, however, that there will be a shortage of pig iron this winter. This leads to the belief that southern furnaces will be able to sell their iron to northern consumers regardless of whether they do or do not quote government figures at furnace, or name lower levels to absorb the freight. The strike at the Eliza furnaces of the Jones & Laughlin Steel Co. came to an end this week, when nearly all of the employes returned to work without gaining any of their points. Comparatively few men struck but a large number were made temporarily idle by their action.

Making no Quotations

Buffalo, Oct. 9.—The pig iron market continues in a quiescent state, with little or no new sales. Conditions are likely to remain thus until the price differentials are fixed. Producers are not quoting. They are behind in deliveries for the most part and are working to clear themselves of these orders in order to prepare for whatever the future brings forth. No prices can be quoted until the war industries board takes the concluding step in the big developments now proceeding.

More Inquiry, Few Sales

Cleveland, Oct. 9.—Livelier inquiry, but practically no sales, tells the story of the pig iron market in this territory, while producers and consumers still look to Washington for the announcement as to grade differentials, base specifications, etc. There is a pretty general understanding among sellers as to a tentative schedule of differentials that has been framed. Pending the official adoption of the latter, however, these are not being quoted. Such prices as are being made here and there on a few carloads for this year to regular customers actually in need are at $33, base, and are made subject to differentials to be announced later. Some sales have been made under these terms. A number of new inquiries have come out in the week. One producer reported as many as 20 of various amounts, usually 500 to 1000 tons each. Many of these call for shipment during next year, but makers will not quote beyond Jan. 1. An Ohio steelmaker has asked for 5000 to 10,000 tons of basic for this year and there are several inquiries for the same grade from the east. A 1000-ton lot of malleable for the local Westinghouse foundry for war purposes still is pending.

Basic Users Inquire

Chicago, Oct. 9.—Aside from an awakening interest in basic pig iron, the Chicago market is practically quiet, as has been the case for several weeks. Steelmakers have been much interested in the market recently and an inquiry for 10,000 tons of this grade is being entertained, coming from a consumer in the St. Louis district. A Chicago consumer has inquired for 1000 tons per month, for first quarter of 1918. So far as can be learned, no quotation has been made on these inquiries, and it is not known definitely if they are more than tentative feelers. Although Chicago stacks are sold for their entire output to the middle of 1918, No. 5 stack at the south Chicago plant of the Iroquois Iron Co. probably will go into blast about Feb. 15, and its production probably will offer some additional tonnage for delivery during first half. Lake Superior charcoal ironmakers are not quoting on inquiries but are offering to sell on open contracts, subject to the prices determined by the government when differentials are announced Some idea is being worked out as to the probable differentials on pig iron, recommendation of makers having taken fairly definite form. These differentials are based on silicon content for foundry, forge and high silicon grades, while flat figures for malleable, standard and copper-bearing low phosphorus have been recommended. A Virginia furnace has sent its agents a tentative schedule of differentials above and below No. 2 foundry analysis. In this case, the manganese, as well as silicon, content is also taken into account, 1 per cent of manganese being the base.

Virginia Makers Adopt $33

Cincinnati, Oct. 8.—The price situation on southern iron still is a matter of much concern. The furnaces are not able to quote, and are simply awaiting some definite move on the part of the iron and steel committee to indicate what the correct price of iron should be. The southern producers are perfectly willing to follow the government's wishes in the present crisis, but the absence of any definite information continues to halt business. A little off-grade iron has changed hands some of it almost at scrap prices. The high sulphur content of this iron puts it in a class by itself with no relative effect on standard No. 2 foundry values. A quick settlement of the price question would be welcomed by both consumer and producer. One item of intense interest is the reported agreement of the Virginia furnace operators on a price of $33 at furnace on No. 2 foundry for this year's shipment. Evidence is present that some Virginia iron has been sold at the new price even before the meeting of the different operators said to have been held Oct. 5. Makers of Ohio silvery iron have a number of inquiries in hand mostly for carload lots, but they are not willing as yet to make any concessions in former quotations. The foundry iron situation is unchanged with no one in the Ironton district offering iron at any price. Requests for cancellations on old contracts are few and far between and only involve a few small lots due small melters.

Southern Makers are Waiting

Birmingham, Oct. 9.—Inquiries are being received by manufacturers of pig iron in the south, but so far nothing heard of new business being taken on. Production is being maintained and delivery of old orders is being carried out pending the ending of the confusion that has obtained since the first announcement of control and fixing of prices by the government for pig iron and steel. Various constructions are being placed on the meaning of the government price of $33, and until there is full understanding on the subject it is not likely there will be any effort to sell in quantity. Furnace officials are looking for differentials to be announced this week and other steps to be taken to clear the situation as to prices. The withdrawal of spot iron from the market has had the effect of hastening some shipments on old contracts. No cancellations of old contracts are being reported. Priority certificates have been obtained by many of the manufacturers here on contracts in hand and shipments so far have not been interfered with by the government. The Alabama Co. will have the Ironton furnace out of commission for repairs about five or six weeks, while the Shelby Iron Co. will rush work on its idle stack. The Birmingham Trussville Iron Co. has assembled considerable raw material and will be producing iron shortly. Rehabilitation of the Sheffield furnaces is well in hand. The rebuilding of a furnace at Bessemer by the Tennessee Coal, Iron & Railroad Co. is going forward. Raw material supplies are a little more plentiful, coke particularly being easier.

No Iron for Sale

St. Louis, Oct. 9.—The market for pig iron here is described by local dealers as a case of suspended animation. Nothing is being done and will not until further information is forthcoming from the government. Numerous inquiries are being received by dealers, but are not quoted upon. It becomes plainer daily that the situation hinging on the government fixation of prices is not working out satisfactorily. Everyone looks upon himself as patriotic and anxious to

co-operate, but seems to expect the other fellow to do it first. The result is stagnation in business and great danger of the price agreement going by the board. Producers furnishing this district are confining their efforts to delivering on contract. A canvas of leading dealers and consumers fails to elicit information of a single ton of new business having been negotiated on the new basis. Numerous smaller plants in the district are beginning to feel the pinch already.

Various Foundry Sales at $33

New York, Oct. 9.—Numerous additional sales of foundry iron have been made to consumers in this district during the past week on the new base of $33, furnace. Generally, this price is taken to apply to iron between 1.75 and 2.25 per cent in silicon, under 0.05 per cent in sulphur. Some of the business done during the week was at $33.50, eastern Pennsylvania furnace, for No. 1X and $33.25 for No. 2X. Current inquiries for foundry aggregate fully 10,000 tons, much of which is wanted for first half shipment. None of the furnaces, however, are taking on anything for shipment beyond Dec. 31. The leading sellers have adopted a policy of accepting business at the new prices only from regular customers whose previous bookings will not cover their requirements for this year. In nearly all cases, other inquiries are being turned down. This policy has been adopted to guard against consumers trying to place tonnages at the new level preparatory to cancelling tonnages previously placed with other makers at higher prices. Current inquiry includes considerable malleable, which it is almost impossible to buy. Brokers who have iron for resale for which many of them paid in excess of $33, have been embarrassed since Sept. 24 by the problem how they can accord their selling policy with the new price arrangement. In a number of cases where sales at $33 would result in considerable loss, the second sellers have disregarded the new prices and have disposed of prompt foundry iron at prices equivalent to $48 to $54, furnace, for No. 2X. This iron is not expected to be a factor in the market very long as not much of it is left. With the exception of resellers, the entire trade is conforming to the $33 base price. The differentials for the various grades of pig iron have been handed in to the war industries board.

Coke Shipments Better

Effect of Government Price is to Stimulate Deliveries on Old Contracts—No $6 Business is Taken

Pittsburgh, Oct. 9.—Coke operators in the Connellsville district generally continue to decline to quote on tonnages for spot shipment, inasmuch as the price level would be $6, ovens, as fixed by the government. Instead, the producers are making shipments against contracts. It is reported in some sources, however, that certain producers are more disposed to consider business at the new price, although no orders have been closed, as far as developed. Consumers who have contracts made on a tonnage basis, however, are receiving their normal supplies of fuel at the government price. It is not believed that there will be a free movement of coke at the government price until after the beginning of the second half of next year, when the greater portion of contracts will have expired. While furnaces are anxiously inquiring for coke and some of them may be forced to bank soon unless they receive spot shipments, it is claimed that as a general thing they are fairly well cared for on contracts. One of the most difficult problems in the coke district is due to a shortage of labor. Unless this is overcome, consumers are going to continue to experience difficulty in getting adequate supplies. The second order of the priority board providing a 100 per cent car supply for coke will no doubt relieve the situation considerably, but will not be as vital a factor as it would seem on the surface, because the improvement in the car supply is offset greatly by the lack of labor. This second priority order does not promise to have much effect on the 100 per cent car supply order for shipments of lake coal, as provided in the first order. Production for the week ending Sept. 29 was 347,408 tons, as compared with 355,102 tons for the preceding week, according to *The Connellsville Courier*. Relief that was expected to be afforded by placing in operation the new by-product plant of the Carnegie Steel Co. at Clairton, Pa., early this month was not forthcoming. This plant, it is understood, will not be in operation before the first part of next year.

Must Furnish Data of Sales

New York, Oct. 9.—No offerings or sales of coke have been made in this district since Sept. 24, and efforts of consumers to obtain fuel at the new $6 price have been unavailing. The only transaction affecting the coke market during the past few days was the purchase by one consumer from another of a forward coke contract. Reports from Washington that all coal and coke producers and dealers are to furnish full particulars about their business to the coal administrator, Dr. Garfield, have aroused much interest here. Several dealers have been requested to furnish within 10 days a record of their transactions since Sept. 24.

$6 Sales are Negligible

Cincinnati, Oct. 8.—All the energies of the oven operators appear to be directed solely to furnishing coke on old contracts. In this effort they are having considerable trouble on account of the diminished output. With the exception of a little domestic coke, neither furnace nor foundry coke can be had for nearby shipment. It is doubtless true that if the former prices in effect before the government's action could now be obtained that many single cars could be located. This coke now is being sent with less delay in shipments to customers who bought some time ago. The agreement to allow jobbers to charge the usual commission on new contracts has not effected sales and the total tonnage of either furnace or foundry coke disposed of in this territory at $6 at oven is negligible. Oven operators still claim that they are handicapped by labor shortages, car shortages and trouble in getting coal.

No New Business Being Done

St. Louis, Oct. 9.—Dealers here are receiving inquiries for goodly tonnages of coke from widely scattered sections. The demand, in fact, is quite as active as at any time this season, but no new business is being done. Since the fixing of the $6 price the ovens supplying this district have withdrawn from the market. They report they will not make any quotations until the entire matter of differentials and other details have been adjusted. Answering dealers the ovens state that they are out of the market for all future business. Current production is being applied on outstanding contracts, and any free coke will be sold from day to day. Outside of a few cars in transit, no new business was heard of during the week. Stocks locally are fairly liberal, and no complaints are heard relative to deliveries on contract. The car situation shows decided improvement.

Southern Coke Improving

Birmingham, Ala., Oct. 9.—Coke production in southern territory con-

tinues to improve as the coal production is heavier. Home consumption and shipments on old contracts require practically every ton of coke being manufactured, the principal accumulation being with the Tennessee Coal, Iron & Railroad and Woodward Iron companies. Inquiry fails to reveal any sales of coke in the open market. Further information is being sought from the government as to the effect of the $6, Connellsville, price on southern fuel. There is some apprehension as to labor agitation in this district as the union is taking the position recent advances in wages are not sufficient nor in keeping with those agreed upon at the conferences at Washington recently between operators and operatives of the central competitive coal fields.

Ore Shipments

Fell Off in September as Balance on Docks Increases

Ore shipments fell off 600,000 tons in September from the mark set in August. The total shipment from upper lake ports last month were 9,536,152 tons against 10,146,786 tons in August. In September the lake fleet for the first month since May moved less ore than in the corresponding month last year. The total season's shipments up to Oct. 1 are 46,059,706 tons compared with 48,816,650 tons up to Oct. 1, 1916. The detailed shipment by ports follows:

Port	September, 1917	To Oct. 1, 1917
Escanaba	1,078,531	5,167,722
Marquette	509,754	2,408,816
Ashland	1,199,297	5,625,209
Superior	2,174,530	10,376,746
Duluth	3,190,347	15,189,368
Two Harbors	1,383,693	7,291,845
Totals	9,536,152	46,059,706
1917 decrease	64,634	2,756,944

Lake Erie docks received 7,313,084 tons of ore during September, as shown by the records of *The Marine Review*. The balance on dock on Oct. 1 was 7,727,036 tons compared with 7,230,024 tons on Sept. 1. The detailed receipts by ports follow:

Port	Gross tons
Buffalo and Port Colborne	1,237,677
Erie	274,128
Conneaut	1,213,829
Ashtabula	1,707,872
Fairport	325,965
Cleveland	1,336,854
Lorain	540,192
Huron	260.131
Toledo	386,255
Detroit	30,181
Total	7,313,084

The Richard Mfg. Co., Bloomsburg, Pa., whose receiver recently was discharged after paying off all obligations, is now operating under its old name. Its foundry, long idle, now is active with a large force.

Ferro Prices Still Drop

Sells at $300 For This Year—Western Buyers Want 4000 Tons of Spiegel—$75 Furnace is Done

New York, Oct. 9.—The recent continued descent in ferromanganese prices became headlong during the past week, and the market now is no higher than $300, delivered, for metal for this year's shipment. Sales of a number of carloads were made at this price during the week. Current inquiry is smaller. The belief prevails in the trade that comparatively large buying will be done as soon as consumers are satisfied that the bottom has been reached. The tone continues soft and further declines are expected.

Inquiries for spiegeleisen have come out from western consumers for a total of 4000 tons of this metal for delivery this year. Considerable competition is expected. At present, the market is quoted around $75, furnace. Several sales were made on this basis during the past week, including one of 500 tons.

Ferrochrome has become so scarce of late that it now is difficult to pick up good-sized quantities. Prices are advancing materially. The difficulty in obtaining spot and nearby requirements has resulted in anxiety as to futures, with the result that numerous consumers desire to close as far ahead as the first quarter of 1918. Ferrochrome, containing 4 to 6 per cent carbon, is quoted at 40 cents, furnace, and futures at 33 to 35 cents.

Several small tonnages of 50 per cent ferrosilicon for spot and nearby shipment have been sold at $175 to $180, delivered, but there have been lower offers.

Recent efforts to advance the ferrotungsten market have been unsuccessful. The market is steady with 70 per cent metal at $2.35 to $2.45, furnace.

Market is Easier

Pittsburgh, Oct. 9.—Due principally to the forthcoming government price, the market for ferroalloys in this district is easier. A small tonnage of ferromanganese is understood to have been taken for prompt shipment at a figure ranging between $325 and $335, as compared with the price of $375 which had been prevailing until recently. A small lot of 50 per cent ferrosilicon was also sold at a figure reported to be $170, which compares with the level of $200 which had been prevailing. Last half 20 per cent spiegeleisen which has been commanding from $80 to $82.50 can now, it is believed, be purchased at $75 or less. A fair number of inquiries is out in the alloy market, but only a small amount of new business is being taken. Buyers who make inquiry as a general thing are in pressing need, while most of the consumers are staying out of the market, pending the announcement of prices by the government.

Ingot Output

In September Shows Decline From Preceding Month

The American Iron and Steel institute estimates that the total production of steel ingots in 1917 will be 42,260,000 gross tons. This figure is determined on the basis of the reports which 29 steel companies are now furnishing monthly to the institute. These companies produced 88.14 per cent of the 1916 steel ingot tonnage.

The September production of these companies aggregated 2,972,259 gross tons, a decline of 150,000 tons from August when their production was 3,123,217 gross tons. The September production fell below the 1917 monthly average, which has been 3,100,000 tons. These companies, so far this year, have produced 27,935,411 gross tons

The detailed report compiled by the institute follows:

	Open hearth	Bessemer	Other	Total
Total 6 mos.	13,681,483	5,164,139	55,198	18,900,820
July	2,152,479	777,171	9,465	2,939,115
August	2,251,013	863,873	8,331	3,123,217
September	2,195,556	770,064	6,639	2,972,259
Total 9 mos.	20,280,531	7,575,247	79,633	27,935,411

Steel Rates Raised

Railroad freight rates on finished steel per 100 pounds in car lots has been increased from 10½ cents to 13½ cents from Pittsburgh to Cleveland. The new rate on less than car lots is 19½ cents. New rates to Chicago are: Car lots, 20½ cents, and less than car lots, 29½ cents; to Buffalo, car lots, 16 cents, and less than car lots, 22½ cents; to Cincinnati, car lots, 17 cents, and less than car lots, 24½ cents. The new rates were effective on Sept. 20. Other points have not been affected.

The National Flake Graphite Co., Ashland, Ala., capitalized at $200,000, has been chartered to mine graphite in Clay county.

Bar Buying is Suspended

Heavy Displacement of Old Orders by Government and Allied Needs Pushes Filling of Trade Contracts Far Ahead

Chicago, Oct. 9.—Lack of buying continues to mark the situation in soft steel bars and it is not apparent now when it will be possible for most mills to take on further tonnages. Buyers apparently appreciate this and are not pressing their demands, evidently relying on old contracts to supply them for some months. Government requirements are beginning to come out in large tonnage. Both France and Italy are taking liberal quantities. Some steel men are beginning to hold the opinion that steel requirements of this government and its allies will take such a tonnage as to prevent the mills filling present contracts much before the end of next year. The volume in which these demands are coming out promises to absorb almost all the steel which can be produced and rolled to finished forms for a year. At present most customers with contracts are being furnished with some steel. This is not as much as they desire, but is enough to prevent acute suffering. Hard steel bars are not in strong demand, but inquiry is better than has been the case recently. Some consumers are asking additional tonnages for last half of 1917. The present quotation is 4.25c to 4.50c, Chicago mill. An increase in inquiry for bar iron is noted, but not much material is being bought. Mills here are sold up until 1918, but buyers apparently are concluding they should place orders for additional material as soon as mills will accept next year contracts.

Decline to Name Prices

Cleveland, Oct. 9.—On a local inquiry for 1000 tons of soft steel bars for quick shipment, the producers have declined to quote. Reinforcing bars continue to be named around 4c, mill, but attractive orders bring out lower figures. There is some selling of shafting at 5 to 10 off list. Bar specifications are well maintained and there are no cancellations of unshipped tonnage on the part of buyers. Sellers in some cases, however, have wiped off business on which specifications had not come within the prescribed time limit.

No Steel Bars at 2.90c

Pittsburg, Oct. 9.—No sales of steel bars at the government figure of 2.90c in this district have been reported. Makers are not quoting and inquiries are comparatively few. Mills are engaged on old contracts and have no available capacity for new business for prompt delivery. Government orders, it is reported, are being placed from time to time and call for large tonnages.

Bar Iron Makers Anxious

Philadelphia, Oct. 8.—Bar iron makers, whose prices have not yet undergone regulation downward, are anxious in some cases to increase the business on their books, and some of them are quoting lower prices. The market now may be quoted at 4.25c to 4.75c, Pittsburgh. Although specifications are heavy, new business is rather light.

The steel bar market, pending the establishment of extras in connection with the new 2.90c, Pittsburgh, price, continues devoid of business.

Selling Some Shafting

Pittsburgh, Oct. 9.—Makers of cold rolled shafting are operating heavily on contracts and are taking a little new business for last quarter delivery. Prices rule from 5 to 10 off list. A great portion of the operations are devoted to government contracts. Nothing has been given out to indicate when the government will fix a price on this product.

Hoops and Bands Quiet

Pittsburgh, Oct. 9.—Producers of hoops and bands report that the market continues to be extremely quiet, with light tonnages being taken for prompt delivery. Manufacturers are waiting for the government to fix prices which it is assumed will apply to these products.

Buying Nuts and Bolts

Pittsburgh, Oct. 9.—Sizable orders for early shipment of nuts, bolts and rivets continue to be placed with makers in this district by various interests, some of whom are engaged on government contracts. A substantial portion of the output of nut, bolt and rivet mills is devoted to work for the government, which is placing additional orders almost daily. These contracts call for delivery for this and next year.

Big Boiler Order Placed

Emergency Fleet Board Distributes 450 Standardized Units For Merchant Ships—8600 Tons of Circles Closed—Prices Vary

Cleveland, Oct. 9.—Orders for 450 standardized water-tube boilers have been distributed by the Emergency Fleet Corp. among 17 manufacturers in all parts of the country. Each boiler will require 12 tons of plates and 15 or more tons of other material, making the total amount of steel called for from 12,000 to 14,000 tons. The government will furnish all the material excepting the rivets to the different boiler shops filling this order. Each shop has made a price covering the cost of labor and rivets, plus a profit. These boilers will be used in equipping merchant vessels now under construction for the Fleet corporation. The government also has distributed 8600 tons of ⅜-inch plate circles of 5 feet diameter, the purpose for which has not been designated. Local mills received some of this tonnage at the government price of 3.25c, Pittsburgh. Some platemakers who buy their slabs still are quoting from 7½c to 8c, mill, or well above the agreed price. Certain eastern and local mills have been following this policy. One maker who produces his own steel also is said to be ignoring the agreed price. A number of the mills are making no prices on plates in the open market.

Can't Get Export Licenses

New York, Oct. 9.—Export interests in this city continue to be embarrassed by inability to get shipping licenses for tonnages of plates available for export. As a result a number of these companies find themselves with considerable plate tonnage which they are unable to move and which they are unable to offer for resale at the new price of 3.25c. Some of these interests, during the past few days, have offered plates for resale at 6.50c to 7.50c, Pittsburgh. Small plate makers in different sections of the country are understood to be in a rather serious position due to the operation of the export embargo. When the embargo went into effect these mills had large export orders. Much of this tonnage since has been worked up and now is piled at the mills. These makers say they are unable to come out whole by selling these plates at the new 3.25c price, but they can see no other way under the new price arrangement.

At some mills where the storage space is limited, the congestion has reached such a stage that cessation of operations is contemplated.

Refuse Offers at 10c

Philadelphia, Oct. 8.—Large orders for plates, which in many cases are offered at the old price of 10c, Pittsburgh, are being turned away every day by the eastern Pennsylvania makers. So far no business has been taken on at the new price, excepting government orders. Many thousands of tons of ship steel again have been placed here during the week by the Emergency Fleet Corp. Extras based on the new price of 3.25c now are in the course of determination for suggestion to the government. It is still too early to state whether, when the question of extras is settled, the mills will be open for business at the new basis. Not only are government orders at present more and more commanding the entire attention of the mills, but some of these makers have complained of their inability to come out whole at the 3.25c price, so it is not to be expected they will go out of their way to take on the regular run of orders at this figure. Present indications are that plate consumers, whether or not their orders now are on the books of the mills, will have to rely entirely on government priority numbers to get their requirements filled. It now appears that after the government has been satisfied there will be little plate tonnage left for other consumers. Several tonnages of plates were offered here during the week at 6.50c to 8c, Pittsburgh, by resellers.

Plate Makers Not Quoting

Pittsburgh, Oct. 9.—Manufacturers of plates continue to stay out of the market for new business at the government price of 3.25c. Mills are well filled for the remainder of the year and, therefore, unable to accept tonnages for domestic use for that period. Government orders are numerous and are being placed constantly. The fleet corporation has placed 7000 tons of plates with an Ohio mill for coastwise vessels to be built in a lake yard. Nothing has been done by the government with regard to its recent inquiry for additional freight cars for shipment to France. This order is being deferred, it is understood, until ship space for transportation of the cars can be assured. Some makers of plates are contending that the government price is too low and that they will suffer financial loss if they produce them at the figure named. Mills which have taken tonnages for export, but had their shipments embargoed, are also complaining that they cannot sell the plates at the government figure. Producers generally, however, feel that the price is entirely satisfactory and will afford a fair margin of profit.

Western Market Dull

Chicago, Oct. 9.—Although some users of steel plates would be willing to pay a premium for prompt delivery, makers in this territory are unable to accept such business and sales of this kind are lacking. Some interference with full output has resulted from a strike of switchmen on a railroad serving large producers in this district, but settlement of the trouble promises immediate restoration of their production. Expected demand from the allies of this government includes considerable plate material and additional rolling capacity in western mills is held to meet the needs from this quarter.

Rod Tonnage

Closed by French Buyers at $88 to $92 on Old Quotations

New York, Oct. 9.—French buyers during the past few weeks have purchased in this country fully 25,000 tons of wire rods at prices ranging between $88 and $92, New York. All of this business apparently has been closed at prices quoted prior to Sept. 24.

Offering Resale Lots

Philadelphia, Oct. 8.—Current activity in semifinished steel is confined to resale offerings. One reseller has some 2000 tons of wire rods and rerolling billets, another a large tonnage of rerolling billets, etc. This steel is being offered at around $62.50 to $65 for soft rerollers. An eastern Pennsylvania platemaker is inquiring for 500 to 600 tons of slabs.

Semifinished is Quiet

Pittsburgh, Oct. 9.—While there are some inquiries out for sheet bars, new business taken by manufacturers is extremely limited. In view of the pending price-fixing program of the government, neither producers nor buyers are showing much interest in the market. Books of manufacturers are well filled for the remainder of the year and even after the price has been fixed, it is expected that but little tonnage for prompt shipment can be sold to domestic consumers. One producer is understood to have quoted $75 on a fair-sized tonnage sought by a tin plate maker. Billets also are very quiet and in a state of uncertainty. Where quotations are being made, thy are, as a general thing, named on the old bases which have been prevailing and in one instance, a price of $90 is understood to have been quoted on a lot of small-size billets. Bessemer 4 x 4 billets, however, continue to be quoted at from $65 to $75, although no sales at these figures have been reported during the past week. Makers are receiving inquiries for wire rods for export and contracts taken for this trade are being closed at $90, Pittsburgh. Tonnages involved are only moderate.

Want Billet Lots

Cleveland, Oct. 9.—Some local consumers of billets have been in the market for several thousand tons each, but have been unable to get quotations from the mills. Sheet bar producers are doing nothing in this territory and are not quoting. Little inquiry of the latter sort is reported.

No Sheet Bars Offered

Youngstown, O., Oct. 9.—Users of sheet bars state that no bars have been offered recently but that $80 would be considered a representative figure in this territory. Some of them say they expect as low as $52 in the government prices about to be announced. It is asserted this figure would permit a legitimate profit with pig iron at $33 per ton.

Cold Strip is Waiting

Pittsburgh, Oct. 9.—Virtually no new business is being taken by makers of cold rolled strip steel. They continue to wait for the government to fix a price on this product and in the meantime are operating heavily on contracts, much of the tonnage being for the government. Only a moderate number of inquiries are out.

Implement Makers to Hold Convention

Chicago, Oct. 9.—The twenty-fourth annual convention of the National Implement and Vehicle association will be held at the Congress hotel, Chicago, Oct. 17 to 19. Following the opening session Wednesday morning, Oct. 17, 10-minute reports will be given by the chairmen of the various departments of the organization. On Thursday, the war emergency committee has arranged to give a series of 15-minute talks, discussing: The Effect of Material Deliveries and Prices, Effect on Cost Standardization and Labor, and Effect on Railroad Transportation. The remainder of the meetings will be given over to addresses pertinent to the industry and to business sessions.

Big Tonnage

Of Sheet Business Expected After Price Fixing—Navy to Buy Heavily

Youngstown, O., Oct. 9.—A large volume of governmental and domestic business is expected by the sheet manufacturers in this territory as soon as the new prices now being determined at Washington are announced. A cessation in the buying of sheets has been noticed the past week. Buyers seem to be feeling out the market as well as holding off until the new prices are made known. Sheetmakers are extremely interested in the priority question and are watching developments closely. Domestic business now on the books is expected to be deferred into the 1918 deliveries when the government's wants are announced. There has been a good inquiry recently for various grades of sheets but few purchases have been made. What little business was done was of light tonnages. Blue annealed, No. 10, is quoted at 7.50c to 8c; black, No. 28, 8c to 8.50c; and galvanized, No. 28, at 9.50c to 9.75c. Lower prices have been named in some cases.

Expect Big Naval Tonnage

Philadelphia, Oct. 8.—Pending the establishment of government prices, business in the eastern sheet market is confined to government orders. A huge tonnage is expected to be distributed in the next few days for naval purposes, and other tonnages are to come out shortly. About 60 per cent of the leading eastern makers' capacity now is devoted to direct government requirements.

Market Tone is Softer

Pittsburgh, Oct. 9.—While practically no new business is being or can be taken by makers of sheets for prompt delivery, the government price-fixing program seems to have been an element in softening the tone of the market. The small tonnages that are being taken for domestic use come largely from stocks. The government continues to place sizable orders for sheets and its requirements are taking a large portion of the output of the mills. Data showing the cost of production have been prepared by makers and it is expected that the government will announce a price on No. 28 gage black sheets soon and that differentials for other sheets will be based on this level.

Buyers are Holding Off

Chicago, Oct. 9.—Consumers of sheets are waiting announcement of government fixed prices but are not buying where they find it possible to postpone taking on further tonnage. Mills have offered to take contracts at the price to be fixed by the government, but buyers have not so far been willing to avail themselves of this offer and prefer to wait more definite figures. At present there seems to be no quotation on sheets in this market, as there is practically no selling. The independent sheetmaker in Chicago now has 15 of its 17 sheet mills operating and shortly will open its galvanizing department which has been inactive for several months.

Sheet Prices Are Lower

Cleveland, Oct. 9.—Sheets show an easier price tendency, pending the announcement of the agreed schedule. Quotations of 7.50c for No. 28 black were made in the week. A local maker continues to quote 6.50c, mill, for No. 10 gage.

Sharp Cut

Of $15 is Announced in Cast Iron Pipe—More Tonnage Expected

Chicago, Oct. 9.—A cut of $15 per ton in cast iron pipe has been made following the reduction in pig iron. This brings 6-inch pipe to $50.50, Chicago, and 4-inch to $53.50. Inasmuch as prices have been a strong deterrent recently, it is believed this change will bring out considerable latent business. Sufficient time has not yet elapsed since the reduction to bring out this demand, but considerable selling between now and the end of the year is expected to follow. The National Cast Iron Pipe Co. has been awarded 150 tons for Minneapolis. A contractor has been awarded 275 tons at St. Cloud, Minn., but has yet to place the pipe. No new municipal business is in the market.

Pipe Price is Awaited

Pittsburgh, Oct. 9.—Announcement by the government of prices for tubular goods is awaited with interest. Predictions are being made that the price for pipe will be fixed on a level as high or higher than that provided by the National Tube Co. card of April 2. No new business is being accepted by the mills, some of which have lap weld orders calling for operations of 68 to 70 weeks and butt weld bookings assuring operations of 18 to 20 weeks. Inquiries are being made for pipe, especially by the oil industry which is seeking lap weld tonnages. Shortage of materials and to some extent of labor has resulted in shipments exceeding production.

Southern Market Weakening

Birmingham, Ala., Oct. 9.—While cast iron pipe plants in the south are operating actively, it is reported that the market for this product is beginning to show weakness. Some concessions have been made, but purchasers are not willing to pay the high prices that have prevailed with the government figure on pig iron considerably less than had been in effect. Orders on hand will call for the output of southern foundries for a long time yet.

More Cars

Placed by Government for Use in France—Locomotives Wanted

New York, Oct. 9.—Orders for 4800 additional narrow gage cars have been placed by the United States government for military use in France and Belgium. Of these cars, 1800 will be built by the American Car & Foundry Co., 1000 by the Pressed Steel Car Co., 1000 by the Standard Steel Car Co., and 1000 by the Ralston Steel Car Co. The Baltimore & Ohio railroad is in the market for steel for 100 caboose cars, which this road contemplates erecting at its own shops. The steel is wanted for delivery prior to June, 1918. The Pennsylvania railroad is in the market for 1000 tons of tie plates.

A new locomotive inquiry for 500 of special type for France has appeared. The American Locomotive Co. has taken an order for four locomotives for the Union Miniere du Haut Katanga.

New Rail Business Light

Pittsburgh, Oct. 9.—No business for either standard rails or light sections has been taken in this district during the past week. It is reported that the government is about to close for a fair-sized order of light rails for use in France. Nothing is known as to what may be done by the government with regard to fixing a price for rails which, it is said, has not yet been taken up.

A considerable number of inquiries have come out for tonnages of standard spikes, some of them for export. Producers are able to take on some new business and as a general thing are understood to be quoting 6.50c, base. New business for small sizes is unusually quiet. It is understood that no recommendation has yet been made to the government as to a price for spikes.

More Car Business Appears

Chicago, Oct. 9.—Demand for railroad freight cars continues to be small and the government is more active than the railroads. An order was placed recently by the govern-

ment for 1000 small ammunition cars for use in France, a western builder taking the order. The Western Pacific railroad is inquiring for 1000 box cars, the Marion & Eastern railroad for 100 all-steel coal cars, and the Central of Georgia for 500 steel underframes. The Illinois Central railroad is expected to issue an inquiry shortly for 3500 freight cars.

Taking Spike Orders

Cleveland, Oct. 9.—Some makers of spikes are able to offer comparatively early delivery and are doing some business. Prices are held at 5.50c, Pittsburgh, for standard spikes, and at 7c, Pittsburgh, for small spikes.

Tin Plate Price

Still is Awaited by Producers—Probably to Cover All 1918

Pittsburgh, Oct. 9.—Manufacturers are waiting for the government to fix a price on tin plate. This is expected to be done as soon as the level for sheet bars has been named. Reports reaching this district are to the effect that a figure for the latter product will be determined in a day or so. It is not known whether the war industries board or the food administration will name a price for tin plate, although it is believed that this will be done by Food Administrator Hoover and that the price will be made applicable through the entire year of 1918. Manufacturers, as a general thing, do not appear to be opposed to this plan, provided that the price for sheet bars also is to prevail during that period. It seems doubtful that some manufacturers will be able to sell at any figure that the government may determine, since they have on hand supplies of sheet bars for which they paid as high as $90 to $100 a ton. The trade generally seems to be in a position, however, to sell at the government figure provided it is reasonable. Pending the fixing of a price, manufacturers will not open their books and probably will be unable to do so before Nov. 1, if then. Owing to the large government orders, they are well booked ahead and will not be in a position to take sizable tonnages for private consumers for prompt shipment for some time to come. There is virtually no new business being taken. What little is moving is being supplied chiefly from stocks. It is understood the government in connection with its food conservation program is endeavoring to have tobacco growers of the south substitute fiber for tin containers.

Huge Boat Tonnage Wanted

Submarine Boat Corp. Asks 69,000 Tons of Fabricated Material For Government Ships—Eastern Mills Offer 3c Shapes

New York, Oct. 10.—Bids on 69,000 tons of fabricated ship steel have been requested by the Submarine Boat Corp. This material is to cover the requirements of the construction of 50 merchant vessels for the government recently ordered from the Submarine corporation. Other large requirements of fabricated ship steel for government vessels are expected to come into the market soon. The first interest to offer structural shapes in this district at the new fixed price of 3c, Pittsburgh, base, or 3.195c, New York, is an eastern Pennsylvania mill. This producer is quoting this level on a limited amount of business. The usual differentials are being named.

Ready to Open Books

Philadelphia, Oct. 8.—At least some eastern shapemakers will open their books for business as soon as the customary extras are established. Owing to present indications, however, that there will be a rush of business at the new price, it is quite likely that these mills only will take orders which are accompanied by government priority numbers. Among structural projects which are being revived is a new power house for the Consolidated Gas, Electric Light & Power Co., Baltimore, for which 600 tons are wanted. The Baltimore & Ohio is inquiring for material for 100 caboose cars. Numerous other inquiries, involving mostly small tonnages, are out, but are attracting no offers. Orders for a large tonnage of ship shapes were placed during the week by the Emergency Fleet Corp.

New Demand is Light

Chicago, Oct. 9.—Although the expectation had been held that announcement of lower prices on steel would bring a rush of buying for building purposes, this has not been realized. While prices have been put at a level where steel can be utilized for structural purposes in a larger field than recently, the matter of delivery still stands in the way and inquiries are lacking. Fabricating shops are getting nearer each week to the end of their bookings, but some government work is appearing which will take up the slack to some extent. It is expected by fabricators that tonnages for the emergency fleet will be placed shortly. A contract has been placed for 712 tons for 21 storehouses at the Rock Island arsenal.

Unable to Get Material

Pittsburgh, Oct. 9.—Fabricators in this district say there is no new business whatever. They report that it is impossible to get mills to quote since the government price of 3c has been fixed, most makers asserting that they are booked for the remainder of the year and are operating heavily on government contracts. The situation is causing considerable worry on the part of fabricators, who have pointed out that it will further tie up commercial building. However, it is reported that makers may accept tonnages as soon as the government announces extras.

More Crane Steel Placed

Cleveland, Oct. 9.—An additional lot of 400 tons of shapes and other forms for cranes to be built by local manufacturers for the American army in France have been distributed to the mills under government direction. A few more structural jobs are appearing. Some new bridge tonnage is current. It is reported the city may revive an addition to the municipal light plant which recently was dropped. The Baltimore & Ohio railroad, however, has deferred action on a large warehouse which it recently had up for bids. Shape mills are selling practically nothing to the ordinary trade at the fixed prices.

CONTRACTS AWARDED

Twenty-one storehouses for Rock Island Arsenal, Rock Island, Ill., 712 tons to Stupp Bros. Bridge & Iron Co.

Factory building for Oneida Motor Truck Co., Green Bay, Wis., 224 tons, to Joseph Rothe.

United States military buildings to be erected in France, 1200 to 1500 tons each, four to the United States Steel Products Co. and one to Whitehead & Kales, Detroit.

School for Virginia, Minn., 220 tons to American Bridge Co.

Key bridge at Washington, 600 tons to American Bridge Co.

Magazine buildings for government, at Lake Denmark, N. J., 225 tons, to Kellogg Structural Steel Co.

CONTRACTS PENDING

Office building for the Germania Building association, Dayton, O.; 500 to 1000 tons, bids being taken.

Waterside power station, Philadelphia Electric Co., Philadelphia, 600 tons, bids being taken.

Bridges for Pennsylvania railroad, 600 tons, bids being taken.

Buildings for New York Shipbuilding Corp., 2500 tons, bids being taken.

Nitrating plant for government, 1800 to 1900 tons. Bids being taken by J. G. White Engineering Corp.

Bridges for Pennsylvania railroad, 600 tons. Bids being taken.

Bridges for New York Central railroad, 500 tons. Bids being taken.

Uncertainty Hurts Scrap

Awaited Government Action on Old Material Keeps Prices on Decline —Buyers Are Holding Off—Sentiment Weak

COMPLETE SCRAP PRICES ON PAGE 802

Chicago, Oct. 9.—Continuous decline marks the scrap iron and steel market in Chicago. Great uncertainty pervades the situation and opposing views are held by consumers and sellers. The former believe that definitely lower quotations will be announced shortly and that reserves now being used can be replaced at a lower price. This has the effect of limiting new buying. On the other hand, sellers hold the opinion that the supply of scrap will be insufficient for the needs of consumers and that the law of supply and demand will bring higher prices. The effect of this is to cause a limited offering of scrap. Practically nothing is being marketed except small tonnages which must be moved quickly. The inactivity is resulting in quotations dropping steadily lower. Though numerous items are purely nominal. Somewhat better tonnages are appearing from railroads. The Santa Fe offers 1700 tons; the Milwaukee, 1600 tons; the Rock Island, 1150 tons; the Union Pacific, 1100 tons; the Wabash, 1070 tons, and the Kansas City Southern, 260 tons.

Some Prices Advanced

New York, Oct. 9.—Prices on mixed borings, turnings, stove plate and grate bars have been advanced in this district during the week by 50 cents to $1 a ton. These advances were due to a rather special demand and hence were exceptions, the general tone being easy. Business in steel scrap is absolutely lacking and in other grades is of very small proportions. Rejections continue numerous since consumers figure that by refusing scrap at the high prices, they will be able to benefit from the reductions which have materialized during the past two weeks.

Rolling Mills are Buying

Philadelphia, Oct. 8.—Current demand for iron and steel scrap in this district is limited to the requirements of the rolling mills. These interests are in need of material and when they find what they want they are buying it without much haggling over prices. There is practically no demand from the foundries or the steel plants. The price on low phosphorus steel has declined $4 and on old car wheels $5.

Fixing of Prices Problematical

Pittsburgh, Oct. 9.—Considerable doubt exists that the government will be able to fix prices for scrap material. It is reported that no recommendations have been made on this subject. The situation as it applies to scrap, it is recognized, is different from that of other products. At the outset it has been explained that there are thousands of dealers throughout the country buying the many grades of old materials from various sources and at widely varying prices. The difficulty of adjusting all of these elements through the process of working out an intelligent and co-ordinated plan of regulating prices of scrap seems to be an almost impossible one. It has been suggested also that by the fixing of a price on basic pig iron the market for heavy melting material would adjust itself and figures for other grades could be based on the heavy melting price. The market is extremely quiet. Dealers are not actively seeking business and buyers, except in cases of pressing necessity, are out of the market.

Prices Break Lower

Buffalo, Oct. 9.—The scrap market exhibits many of its last week tendencies owing to the fact that the meeting of the government representatives with the members of the National Scrap Iron association has not yet been concluded. At the same time this has caused a temporary break in the market and prices on almost all grades have dropped. Any trading that has been done has been between dealers. Consumers have stopped buying until definite prices prevail. In the meantime the railroad conditions of embargo and car shortage have combined to bring the trade to a standstill. Heavy melting steel has gone from $31.50 and $33 to $30 and $31.50; stove plate from $21 and $22 to $20 and $21; No. 1 busheling from $28 and $29 to $26 and $27; cast borings from $20 and $21 to $19 and $20; machine turnings from $18 and $19 to $17 and $18; No. 1 railroad wrought from $43 and $44 to $40 and $41; wrought pipe from $28 and $29 to $26 and $27; car wheels from $35 and $36 to $32 and $33.

Market Still Weakening

Cleveland, Oct. 9.—Rumors of impending higher prices have little effect on the weakened scrap market in this territory. There is not enough buying to establish definite market quotations, but sentiment is weak. Dealers as well as producers and consumers of scrap are sitting tight, waiting to see what Washington is going to do. It is generally expected that the government will lower prices, some think as low as $20 a gross ton for heavy melting steel; others expect it will be not far from $25. Dealers look for prices to be set on the major grades, such as heavy melting steel, machine shop turnings and cast borings, and for differentials to be worked out from these prices.

Market Still Drifting

Cincinnati, Oct. 8.—Scrap quotations are only nominal in this district, as there is still very little business by which to test the market. The foundries are melting scrap at a heavier rate than heretofore, but their purchases are confined to immediate needs. With the probability of government supervision of prices there is no incentive for buyers to contract ahead. Dealers themselves are somewhat at sea and are taking only a lukewarm interest in selling for future delivery. No. 1 railroad wrought has again declined and is now quoted at $30. Stove plate is down to $16, and is not firm at this figure.

Conditions are Demoralized

St. Louis, Oct. 9.—Demoralization continues in the market for iron and steel scrap. Very little trading of any sort is being done, and until a definite price basis is established affecting the various grades, there is little likelihood of either buyers or sellers taking the initiative. The principal consumers are out of the market, claiming they have under contract sufficient tonnages to cover their requirements for a long time to come. It is growing daily more apparent, however, that their stocks are dwindling rapidly, and it is only a matter of days before they must take steps to replenish. Some dealing between dealers was noted during the week but these transactions are without market significance. Offerings from all sources continue insignificant.

Southern Market Uncertain

Birmingham, Ala., Oct. 9.—The iron and steel scrap market is decidedly unsettled in southern territory. Prominent dealers say that there is a little trading going on and that consumers are making lower offers almost daily. Weakness is pronounced, that is as to quotations. With but two or three exceptions, all prices have dropped. No. 1 machinery is off $2 or more, while stove plate and turnings are lower. The cause for the unsettled condition is attributed to the pig iron and steel market, as affected by government price fixing.

Admit Food Bill Killed Team Work

Council of National Defense Finally Recognizes Seriousness of Clause Threatening Business Men in Lending Government War Co-operation and Bends Efforts Toward Restoring Sorely-Needed Relations—Iron and Steel Men Act Independently

WASHINGTON, Oct. 9.—Section 3 of the food control bill has finally been admitted by the council of national defense to contain drastic penalties for those men, particularly iron and steel manufacturers and producers of raw materials, who gladly gave the government advice and counsel in special matters pertaining to the conduct of the war. Members of the subcommittees of the council, especially those in the American Iron and Steel institute, who were leaders in opposing the drastic section, have been vindicated in their position by this action of the council. About all that remains of the council are its chief executives, members of the war industries board and their close associates. In other words, the council today is only the skeleton of what it was two months ago.

Redrafting Plans for Council

Director W. S. Gifford of the council is now, and has been for some time, engaged in drafting plans for the reorganization of the council with a view to securing the co-operation and assistance of these business men without the danger of liability to punishment under the section. It has been stated by some government officials that the only way such a plan can be formulated is to have the section repealed. Attorney General Gregory, upon request of Chairman Scott of the war industries board gave an informal interpretation of section 3 which proved unsatisfactory. If the government's advisors had heeded it in spite of advice of their own council, it would have put them in hazardous positions as far as their business careers, in connection with government contracts, are concerned.

While these subcommittees have been divorced from the council as semi-official government functionaries, the council has asked that the committees be kept intact so that the war industries board may go to them for such assistance and advice as they may give without placing themselves in jeopardy of the food control law, and possibly the Sherman and other anti-trust measures. The American Iron and Steel institute's committee on steel and steel products and other committees allied to this, including those in copper, tin, spelter, etc., will continue in their present personnel but will be independent of the council and subject only to such action as the committees themselves decide.

In steel matters for the present, the government will rely on advice of the institute's steel committee, the point of contact being through James B. Bonner, the institute's representative in Washington. Whatever advice the government wants on steel will be transmitted to and through Mr. Bonner and if the government requests it, this and other committees will come to Washington from time to time for conferences.

All arrangements that have been made by the government and these committees as committees of the council, will stand for the present. As pointed out in THE IRON TRADE REVIEW last week, any violations of the anti-trust or other laws which may have been made through these joint conferences will be overlooked by the government, despite rumors to the contrary. This statement was made by a close advisor of Bernard M. Baruch, chairman of the general raw materials committee of the council, and is seen in the continued policy of the government to sanction such meetings; for example, the oil conference last week which was very similar to the steel conference prior to the announcement of steel prices Sept. 24.

Emphasis has long been laid upon the fact that industry should direct this war and if such is the case the government, either through Director Gifford or some one else, must formulate some plan by which business men prohibited by section 3 may serve the government without having to sever all business relations with their own private companies. While it is to be regretted the government went to sleep and let meddlesome congressmen put in such a joker as is contained in section 3, the nation should rejoice that these weaknesses in the organization of the council have been exposed. This will enable the reconstruction of the council and its war industries board along sound business lines.

Now Admit Food Bill Folly

Members and officers of the council and the war board have tried to make light of the seriousness of section 3 and from time to time have denied the destruction of the council's superstructure really impended. Now, however, they not only admit it, but some even assume an I-told-you-so attitude. They have insisted Mr. Gregory's opinion, which was supplemented by an explanation of section 3 from Mr. Gifford, cleared the situation and that any man who then refused to serve was as much a slacker as the man who refused to enlist in the army or submit to the draft. It's all changed now. Wise counsel of committeemen finally have proved they know as much law as do some government officials and other government officers are glad to listen to them.

New Plants

Will be Built by Government to Construct Many Destroyers

Washington, Oct. 9.—In announcnig today that the contracts for 150 destroyers which the navy is to build under $350,000,000 appropriation have been awarded to six shipbuilding companies, Secretary Daniels declared the government will construct and own new plants which must be erected to build engines for these destroyers. It also will construct and own extensions which must be made to present yards in order to carry out the program.

The yards which will build new destroyers are those of the Fore River Shipbuilding Corp., Boston; New York Shipbuilding Corp., Camden; William Cramp & Sons Ship & Engine Building Co., Philadelphia; Newport News Shipbuilding & Dry Dock Co., Newport News; Union Iron Works, San Francisco; and Bath Iron Works. These builders promise some deliveries in nine months and all within 18 months. These destroyers when added to the navy's entire war program make a total of 787 vessels whose aggregate cost will be approximately $1,450,400,000. They include all types of warships from dreadnoughts to submarine chasers. Some recently were completed and now in service. Others are being pushed to completion. The entire program evidently calls for approximately 300 destroyers because Secretary Daniels said almost as many as are contemplated under these new contracts already are being built and that the yards previously had taken orders for all they could build. That is why new engine plants and additions must be built.

Would Expand British Steel Output

Members of Iron and Steel Institute Compare British Open-Hearth and Rolling Mill Practice With That of United States and Germany —Charles Schneider Next President

REMARKABLE reports on British open-hearth and rolling mill practice as compared with that of Germany and America absorbed the attention of iron and steel men who attended the annual meeting of the Iron and Steel institute at Westminster, London, Sept. 20 and 21. Much of the discussion centered about the report of a committee appointed some time ago to investigate the methods of steel production in various countries with a view of discovering the weak points of British practice and increasing the production in Great Britain to a point relatively comparable with that of rival countries.

At the opening session Sir William Beardmore, president of the institue, announced that the next president will be Charles P. E. Schneider, Schneider & Co., Rue d'Anjou, Paris. M. Schneider is managing director of the great French gunmaking firm whose principal plants are at Creusot.

E. H. Saniter, vice chairman of the committee on steel and its mechanical treatment and ferroalloys, presented a preliminary report of the metallurgical section of the committee. The report contains a large number of questions which were submitted to iron and steel manufacturers in Great Britain. The questions deal with open-hearth practice in the United States, France, Belgium, Germany and England, and pertain to the nature and proportion of raw materials used, the processes employed, size of furnace used, special designs, general layout, producer practice, labor conditions, management and grade quality of products produced.

Cost of Extension Prohibitive

In the discussion which followed the presenting of this report, Alleyne Reynolds, Brighton, claimed that one cause of British inferiority in practice is the enormous expense of making extensions. He stated that in England it cost a shilling a yard to acquire and wreck cottage property or licensed premises. Foreign countries, he stated, obtain adjacent property at the cost of grass land and are allowed to use the public streets for conveying material by locomotive to the furnace. Cosmo Johns, Vickers Works, Sheffield, expressed keen disappointment with the report stating that it was incomplete and misleading. He emphatically denied that the open-hearth production in Great Britain is in such a despertae state as outlined in the report. He took exception to the statement that open-hearth steel costs seven times as much in England as in Germany, and asked authority for this statement.

Mr. Rogerson compared open-hearth systems of England and America, stating that one large difference in the practice is that the furnaces in America are operated six days a week while those in England are operated only five days. Mr. Rogerson did not agree that American manufacturers get 50 per cent more production from their furnaces than the British manufacturers. W. Simons, Stoke on Trent, asserted that Germany's production per furnace exceeds that of England largely because the German steelmakers operate their furnaces seven days a week. He also stated that Germans used shallow baths, and make as many as four charges in 24 hours.

The report of the mechanical section of the committee of steel and its mechanical treatment was submitted by A. J. Capron, vice chairman. The report includes 11 questions pertaining to cogging billets, finished sections and slabbing. The intention in submitting the question is particularly to ascertain the main causes of the relatively small output obtained in many cases in England compared with foreign practice. The general conclusion, boiled down from the answers received to these questions are that if the steel trade of Britain is to hold its own in open competition with other steel producing countries of the world, it will be necessary, among other changes, to have a central power to which all orders will go, and from whence the work will be allocated to the different works according to their ability to do it. This would save the enormous amount of capital locked up in stacks of rolls.

Presentation of Papers

E. B. Wolf, Bussum, Holland, presented a paper at the Friday morning session on the "Failure of Boilers, Plates in Service and Investigation of the Stresses that Occur in Riveted Joints". The paper was discussed by J. P. E. C. Stromeyer; J. T. Milton, chief naval engineer, Woolwich; T. Carlton, marine department of the board of trade; Dr. Rosenhain, Dr. Desch, Dr. Arnold and C. H. Ridsdale, Middlesbro. "Notes on the Present Knowledge and Practice in Regard to the Briquetting of Iron Ores" was presented by Guy Barrett, Ebbw Vale and T. B. Rogerson, Glasgow; Georges Charp and Andre Cornu-Thenard, Paris, are the authors of a paper entitled "New Experiments on Shop Tests and on the Determination of Resilience", which was summarized by G. C. Lloyd. Dr. Rosenhain stated that the paper placed the impact test of steel bars on an entirely new level. The main point brought out in the paper, according to Dr. Rosenhain, is the possibility of getting perfect uniform results by the method described. The speaker complained of the use of "resilience" in connection with such a subject, when what is really measured is the work done in a breaking test. A real suitable word is yet to be found. Other speakers agreed with this complaint as to the use of the word.

King George Visits Steel Works

On Sept. 18 and 19, King George visited a number of important British steel works on the Clyde, including those of David Colville & Sons, Sir William Beardmore & Co., Moss End; Stewarts & Lloyds, Clydesdale; and David Rowan & Co. At a large Motherwell works, the king was told by John Gallon, a member of the local conciliation board, of the harmonious relations between employer and employe. King George paid a tribute to the iron smelters in a conversation with Robert Bullock, executive of the Steel Smelters association. At the conclusion of the tour, the king made public a letter in which he commended the employers and employes of the great industrial center for the spirit of co-operation displayed in supporting the heavy task of English sailors and soldiers.

Export Council

Discusses Foreign Trade and Ante-Bellum Competition

The determination of the foreign trade interests of the United States to exert every ounce of energy in winning the war was the keynote of the annual meeting of the National Foreign Trades council which met at the Biltmore hotel, New York, Oct. 4. Emphasis was laid by representatives of every element of foreign trade upon the great importance of maintaining foreign trade as essential to the preservation of the national credit and to the continuous importations, especially during the war, of materials indispensable to the conduct of military operations as well as to the maintenance of the industries of the United States and its allies.

The program included reports from several committees of the council including those on foreign relations, merchant marine, banking relations in foreign trades, co-operation in foreign trades and others. E. P. Thomas, president, United States Steel Products Co., and chairman of the special committee on export control, submitted a report which pointed out the difficulty of framing and putting into effect export regulations. It is announcing the appointment of this committee mentions some of the questions which are puzzling steel-using members of the association. Some of these are as follows:

When will shipments at new prices begin?

Will the government fix the price of steel from stock?

Is it purposed that announced steel prices based on Chicago and Pittsburgh mean that producers in the Pittsburgh district will absorb the freight on Chicago deliveries or will the purchaser pay the Pittsburgh price plus the freight?

Does $33 for pig iron mean furnace or delivered?

How will the reduction affect cold rolled, alloy and other special steels, and will ferroalloys be fixed?

Increased Earnings Shown by Colorado Fuel

Inthe twenty-fifth annual report of the Colorado Fuel & Iron Co. for the year ending June 30, 1917, just made public, gross receipts from sales are given at $40,004,886, compared with $25,625,605 in the previous year, an increase of 56.1 per cent. Operating expenses, however, were $31,771,568, as against $21,280,519 and net earings were $8,233,318, an increase of $3,887,232, or 89.5 per cent.

Statement of earnings and expenses for the year ending June 30, 1917, with increases over the year ending June 30, 1916 are as follows:

		Increase
Total gross rec.....	$40,004,886	$14,378,281
Total operating exp..	31,771,568	10,491,048
Net earn. to inc. acct.	8,233,318	3,887,232

Manufacturers Want Light on New Steel Prices

Chicago, Oct. 9.—The Illinois Manufacturers' association has appointed a special committee to have charge of the association's interests in the present iron and steel situation. This committee consists of Charles Piez, president of the Link Belt Co., chairman; William Nelson Pelouze of the Pelouze Mfg. Co., and T. E. O'Brien. A circular of the association an-

Steel Committee Meets

New York, Oct. 9.—The general committee of the American Iron and Steel institute today held an extended meeting at the office of Chairman Elbert H. Gary, at 71 Broadway. In addition to Chairman Gary, those present were James A. Farrell, E. A. S. Clarke, John A. Topping, Alva C. Dinkey, E. G. Grace, James A. Burden, H. G. Dalton and Willis L. King. In addition, the chairmen of the various sub-committees attended the meeting. Following the meeting all those in attendance left on the 4 o'clock train for Washington, where a conference will be held with the war industries board relative to prices on iron and steel products which have not yet been established.

Nail Orders Taken

Pittsburgh, Oct. 9.—Fair-sized tonnages of wire nails for domestic use are being taken by independent producers, who are strictly upholding a figure at $4 a keg. In view of the price of 2.90c for steel bars, the trade has expressed doubt that the government can consistently do business on a wire nail basis lower than the figure now being named. The price of kegs now is around 18 cents each.

The Non-Ferrous Metals

Copper Lead Spelter Tin

New York, Oct. 9.—Interest in the non-ferrous metal trade has remained focussed on the situation in the copper industry the past week. There have been several meetings of representatives of the copper producers with representatives of large copper consumers and further conferences have been held with government authorities. All these meetings have been held to discuss problems of distribution growing out of the fixing of one price, 23.50c, for copper bought by the government, the allies and the public. The principal development in this respect recently has been the realization in the metal trade that the government was going to take much more copper than had been expected.

A member of the copper committee stated that it has been estimated that the government would need 120,000,000 pounds monthly during the last three months of this year, of which 70,000,000 would be for the allies and 50,000,000 pounds for the government itself. This estimate, it was stated would be subject to revision, and now it is reported has been scaled down somewhat. However, production in September was only 130,000,000 pounds, while an average output for the last three months of 160,000,000 pounds is about the maximum expected. Therefore a shortage is predicted will take place among those industries not engaged in war work. The refineries are husbanding their supplies of copper and shipments are going forward only to those companies doing government work. Some plants have been forced to curtail operations, because of lack of copper, the only available new metal being small lots of spot metal held by various dealers. These small lots have been commanding premiums of from 5c to 8c over the fixed price. Considerable activity has taken place also in scrap copper, at 25.50c to 26c for heavy copper cut crucible size. Casting copper is quoted 27c for October delivery.

The upset condition of the copper market and the fear of a possibility of a shortage of this metal is reflected in the lead and spelter markets. Many consumers use all three metals and they feel if they are not going to be able to obtain copper there is no use in stocking with lead or spelter.

Prime western spelter has eased off again this week, offerings for prompt shipment at 7.87½c, St. Louis, being reported. Some producers continue to ask 8.12½c, but no business at this level is reported. For November and September shipment, 8.25c, St. Louis, is quoted.

The government arranged for its October lead requirements this week, the price to be the same as the average quoted by the *Engineering and Mining Journal* for the month, with the provision that 8c, St. Louis, is to be the maximum. Thus the price to the government and the public automatically is made the same. At present outside sellers are shading the leading interest's quotation of 7.92½c, St. Louis, quoting 7.75c to 7.87½c, St. Louis.

The tin market is little changed from a week ago. Spot Straits today is nominally quoted 61.25c; spot Banca, 59.50c to 59.75c; spot Chinese, No. 1, 56.75c to 57c.

There is no activity in the antimony market. Chinese and Japanese brands are freely offered at 15c, duty paid, for spot delivery.

The aluminum market is quiet and weak, with practically no inquiry in the market. No. 1 virgin aluminum is quoted 41c to 41.50c; No. 1 remelted is quoted 39c to 40c; No. 12 alloy is quoted 33c to 35c.

Steel Castings for Ordnance Work

This Concluding Installment Tells How the Government Operates Its Foundry at Watertown—Many Experiments Lead the Way to Improvements of Physical Properties

BY MAJOR C. M. WESSON

I PREVIOUSLY referred to the earlier difficulties in procuring steel castings some 17 years ago. Today the situation as regards the larger castings of the lower grades is satisfactory, but as regards the small higher grade castings, it is still far below what it should be. The Rock Island arsenal and the large private ordnance manufacturers have been having great difficulty in securing satisfactory small castings. I learned recently that a number of large howitzer carriages, which are being manufactured by a large private corporation, have been greatly delayed in completion, because two separate sub-contracts, which it placed for the small castings involved, had been cancelled on account of failure to deliver them.

In connection with this subject, I quote from an official letter of recent date as follows:

"A reply to preceding endorsement has been delayed with a view to determining what success we would have in obtaining steel castings on existing contracts placed with steel casting manufacturers. * * * The results, except for cast steel No. 1, are very discouraging. Practically all of them make "steel castings," generally without regard to physical qualities. Cast steel No. 3 and No. 2 are almost beyond their ability. Many of them with whom the subject has been taken up knew nothing about physical qualities. We had expected to obtain satisfactory results from the * * * but they are having much trouble with a large order for steel castings No. 3. It is apparently due to their inability to obtain coke with a low sulphur content." As regards this question of sulphur, I personally believe that if the sulphur difficulties are not sufficient to prevent the production of the No. 2 grade, there should be no reason why the No. 3 grade could not be made.

Small Details Are All Important

Satisfactory small steel castings of both the No. 2 and No. 3 grade can be made, and by any of you who possess ordinary foundry equipment, if you will take the precautions to procure suitable material, and exercise the proper care as to details. These latter extend not only to the production of the metal itself, but include the essential items of mold treatment, molding sand, gates, risers, etc. The best metal that can be produced will result in porous or cracked castings, if the mold which receives it does not measure up to certain requirements. This problem of the mold you are meeting every day in castings demanded for the motor-car industry, and others where intricacy of pattern equals, or is greater than that encountered in ordnance work.

In the remainder of this paper are outlined the basic features on which the practice at the government arsenal at Watertown rests. No claim is made to originality. The practice outlined is believed to represent good methods. Unquestionably, there is large room for improvement. The equipment of the foundry at Watertown arsenal may be sub-divided under the following headings: (1) molding, (2) drying, (3) melting, (4) annealing, and (5) cleaning.

The molding equipment consists of one jar squeezer for brass work, 22 x 26-inch table, 36 inches between sup-

Second and final installment of a paper read at the Boston meeting of the American Foundrymen's association, Sept. 24-28. The author, Major C. M. Wesson, is officer in charge of manufacture Watertown Arsenal, Watertown, Mass.

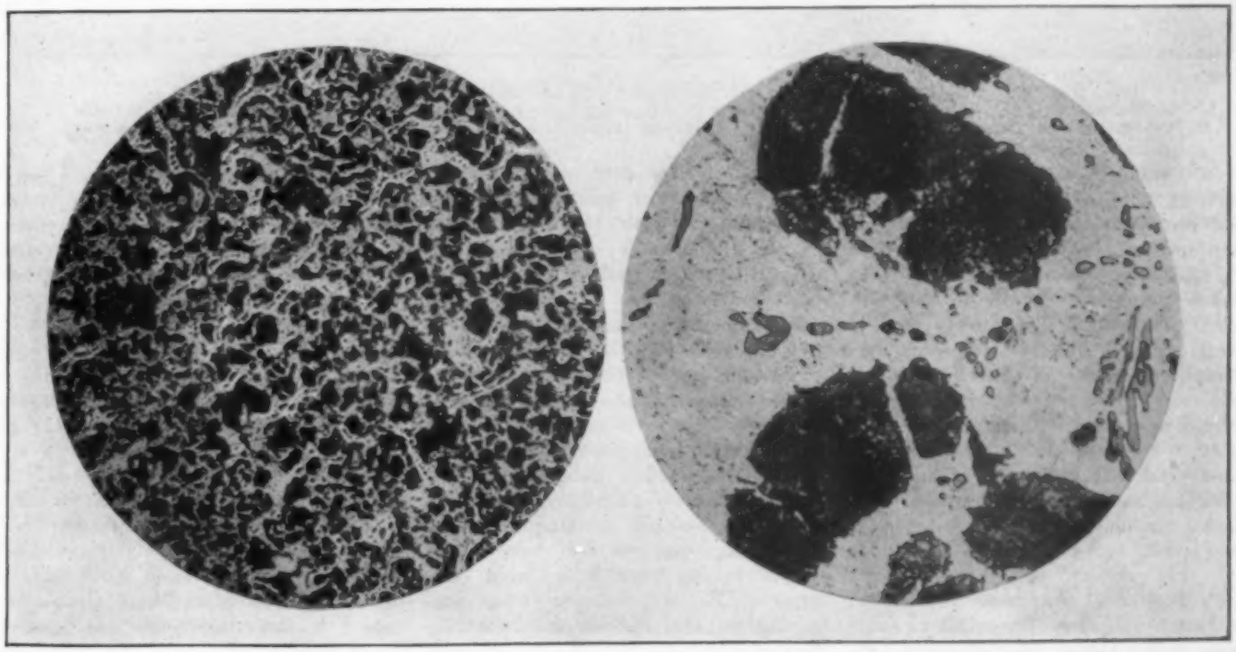


FIG. 1—MICROSTRUCTURE OF NO. 3 CAST STEEL DEFICIENT IN DUCTILITY

At the left, 50 diameters; at the right, 500 diameters. Carbon, 0.42 per cent; manganese, 0.72 per cent. Yield point, 52,500 pounds per square inch; tensile strength, 85,500 pounds per square inch; elongation, 9.5 per cent; contraction, 9.5 per cent

ports; one 6 x 4-foot jolt machine; one 3 x 3-foot jolt machine; and one 18 x 24-inch jolt machine.

The machines are used for jolting dry or green sand steel work, small and medium in weight, also the small jolt is used for jolting snap-flask work, often with two flasks on one board. Heavy air rammers and light bench air rammers are largely used by the molders and are popular.

The drying equipment consists of one mold oven, 24 x 19 x 9 feet high; one mold oven, 22 x 15 x 10 feet high; one core and snap flask mold oven, 20 x 9½ x 10 feet high and one core oven, 18 x 6 x 10 feet high. The latter is served by two narrow gage cars, the oven opening at both ends and the cars entering one end from the core room and discharging from the opposite end into the foundry.

The melting equipment consists of one 15-ton tilting open-hearth furnace, oil-fired. This furnace can easily melt 15 heats per week of acid steel, using low-phosphorus stocks and steel scrap. It is served by thirty 3000-pound charging buggies on narrow gage tracks. All stock is elevated with a 3-ton electric hoist from flat cars. The charging is done by hand, assisted by two 1000-pound air hoists.

Converter

The converter equipment consists of a 2½-ton side-blow Tropenas converter with Roots blower, motor driven, the blower equipment being in duplicate and one 42-inch cupola with charging platform 15 feet above the foundry floor. The charging platform is served by a 10-ton elevator.

The equipment for melting alloy additions for the converter metal consists of drip-pan, oil-fired furnaces, served with chain hoists and overhead telpher. The ladle equipment consists of two 20-ton open-hearth ladles, bottom pour, and the usual number of top-pour worm-gear foundry ladles, from 5 tons capacity down; also one 2-ton bottom pour ladle for handling iron and steel from the converter. The ladles are heated by top fired combustion chamber ladle heaters.

In addition to the foregoing there are five coke-fired individual pot brass furnaces which take pots up to No. 300.

The melting and molding bay is approximately 48 x 300 feet and is served by one 10-ton crane; one 20-ton crane with two 10-ton trolleys, and one 30-ton crane with two 15-ton hoists.

The annealing equipment consists of two car bottom furnaces which are described in more detail later.

The chipping and cleaning shop is served by one 5-ton electric hoist; two 3-ton electric hoists; one 5-ton jib crane and additional chain hoists; three oxy-acetylene cutters and welders; one high-pressure two-nozzle air blast, the room being large enough for two 5-foot square buggies; one 8-foot sand mill; three cold saws; one two-wheel stationary grinder; and two cold saws for bronze work. Several types of air hammers are used.

Castings to meet the various grades specified above, or special grades of alloy steel castings when so specified, are produced in weights from a few ounces to 15,000 and 18,000 pounds each. Many of the castings are made from individual patterns, the orders for castings from each pattern usually not exceeding 100, many times not exceeding 10 to 20. Many of the sections of the smaller castings being very light and the design intricate, necessitates complicated core work and careful molding. Releasing to prevent hot checks and cracks is often necessary. Many of the heavier castings weighing from 200 to 5000 pounds are bulky and of easy sections, some castings being 6 to 8 inches thick. Some of the heavier castings have large lightening cores and thinner sections as low as 1 inch in thickness, and hence are difficult to produce. It will thus be seen that there is a great variety of castings being produced.

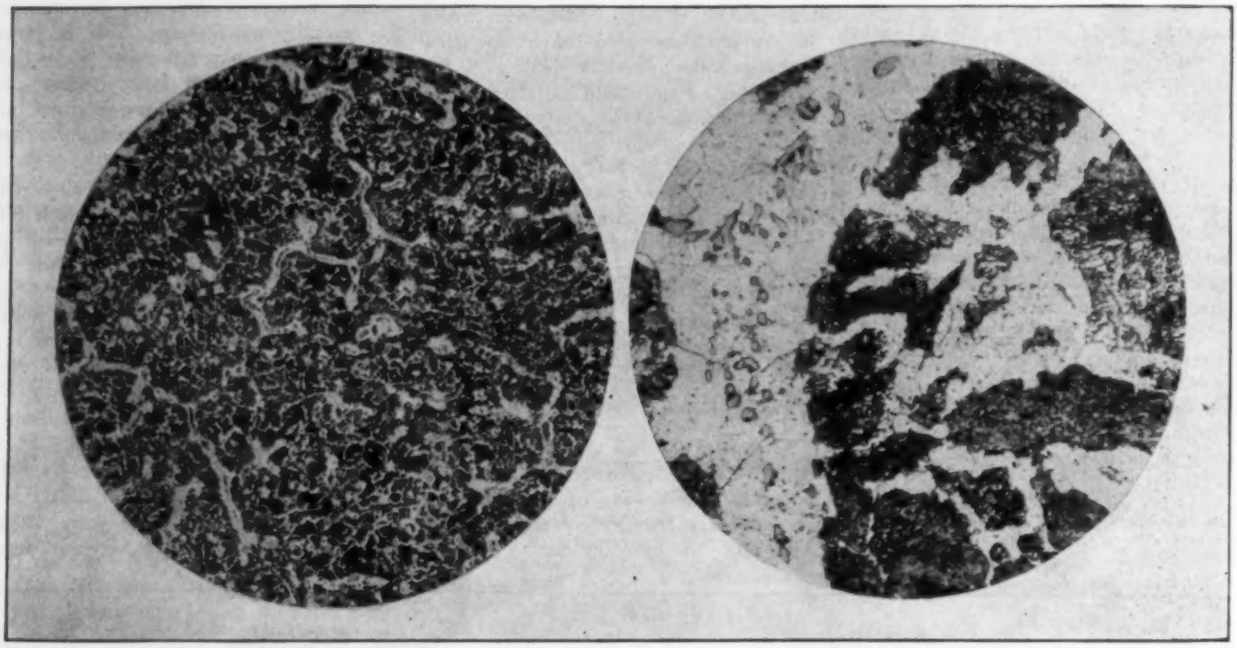


FIG. 2—MICROSTRUCTURE OF ANOTHER SPECIMEN DEFICIENT IN DUCTILITY

At the left, 50 diameters; at the right, 500 diameters. Carbon, 0.43 per cent; manganese, 0.72 per cent. Yield point, 51,500 pounds per square inch; tensile strength, 86,500 pounds per square inch; elongation, 7.5 per cent; contraction, 13.3 per cent

Molding

Nearly all of the work is made in dry sand, using various mixtures of silica sand, silica rock, heap sand, clay and molasses water. The mixtures are transferred to the molding floor in wooden boxes. These mixtures are worked out by the superintendent and the foreman according to the nature of the work, and are varied from time to time according to the available materials. A large percentage of ground silica rock has always been used by the arsenal foundry, and while its cost has been considerably greater than the

cost of an equivalent amount of 98 per cent pure silica sand, the results have been so satisfactory that its use has been considered well justified. There has been an unusual lack of the most common foundry troubles, such as scabs, drops, washes, crushers, broken cores, etc., and the cost of cleaning and chipping off of burned sand adhering to the castings has been found to be quite low. The use of old heap sand in the mixture of stronger facings has been kept down to a minimum, and while its use might possibly be increased in some cases, any great increase would probably show a corresponding increase in expense of cleaning and losses due to increased numbers of defective castings.

man hours of the shop are applied on molding machine work.

Whenever possible, castings are gated and poured from the bottom and the usual foundry rules in this respect are followed as to the size of gates to give proper speed of pouring, etc.

The location of risers has been worked out in the superintendent's office, in conjunction with the foremen of the pattern shop and a riser boss. Correct risers have been provided by the pattern shop before the patterns are delivered to the foundry. This makes it possible to be assured that risers of the correct size will be properly located by the molders, even though a new molder may get a pattern with

the desirability at the time. For example, on many of the smaller castings weighing as low as 400 or 500 pounds, which have thick sections and can easily be run with open-hearth metal, it has been found desirable to pour from the open hearth, because the metal is cheaper and slightly more uniform in chemical composition and meets the physical requirements more regularly.

Pouring Castings from Converter

On the contrary, many heavy castings that it would be desirable to pour from the open-hearth (castings weighing up to 4000 pounds) may occasionally be poured from the converter metal as would be the case if the converter is

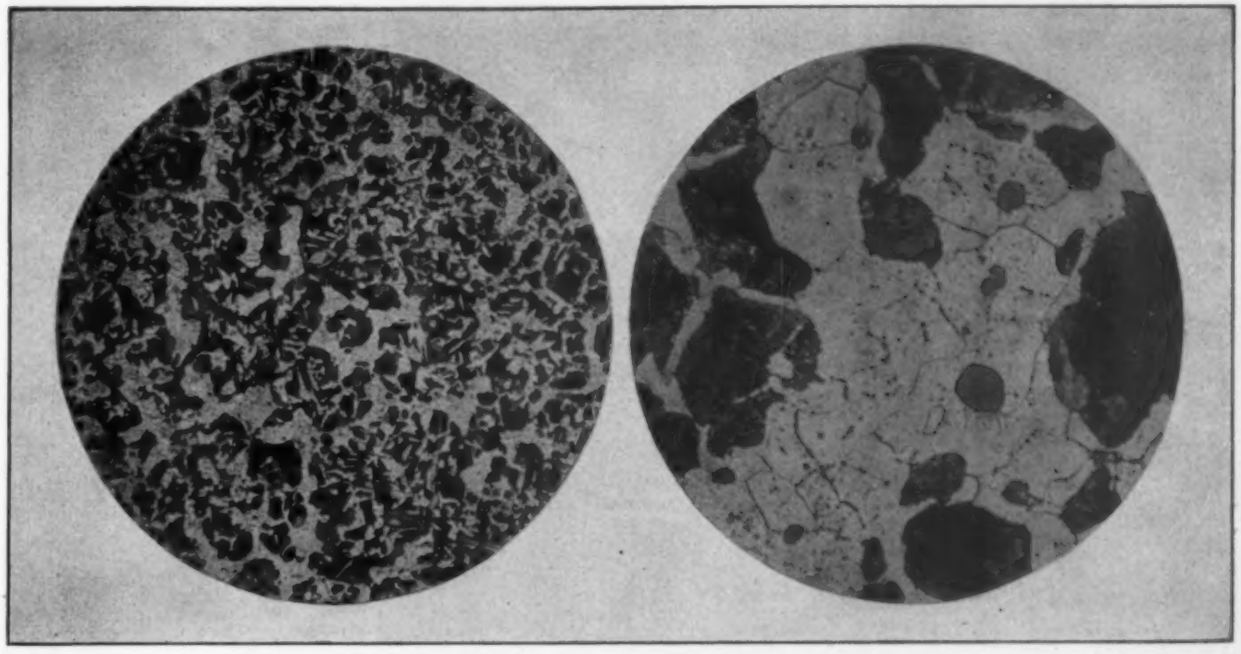


FIG. 3—MICROSTRUCTURE OF SATISFACTORY SPECIMEN

At the left, 50 diameters; at the right, 500 diameters. Carbon, 0.426 per cent; manganese, 0.52 per cent. Yield point, 45,400 pounds per square inch; tensile strength, 85,300 pounds per square inch; elongation, 18.0 per cent; contraction, 23.2 per cent

Due to the fact that virtually all of the arsenal castings are subject to specifications to meet difficult service, and many of them are machined all over and practically all of them machined in part, it has been found difficult to satisfactorily produce much of such work in green sand. Occasionally, the percentage of work made in green sand can be increased.

Relative Hand and Machine Work

There is no jar-squeeze work done. There is a small amount of straight jolt work done on the small jolt machines, using snap flasks; all such work being dried. There is a considerable amount of small and intermediate work from individual patterns made on straight jolt machines and these are butted off with hand air rammers. Probably not over 15 per cent of the

which he is not familiar. Previous practice which has been found satisfactory is thus transmitted automatically to the shop and adhered to. A common rule of keeping the height of riser approximately 1½ times its diameter has usually been found satisfactory. The percentage of riser necessary, naturally varies from almost nothing in some of the very light castings which do not require much feeding to 25 and 30 per cent in the heavier castings which may not solidify for two or three hours after pouring.

The majority of the converter blows are poured into steel castings. All of the small intricate-section snap flask castings are poured from the converter. Many of the medium and fairly heavy castings are likewise poured from the converter metal or from the open-hearth metal alternately, depending upon

running when the mold is ready and the open-hearth is not ready or is on an ingot heat. The flasks are thus released and the production kept up although at a slight increase in the actual cost of the molten metal. On all the more important and heavier castings, at least two coupons are cast on the body of the casting. For the less important and lighter castings, either from the converter or the open-hearth, two standard test coupons are cast from a single runner. These coupons are approximately 1½ inches at the bottom, taper to 2 inches for a height of 5 inches and are 6 inches long. These test pieces are poured at about from the middle of the ladle. All test pieces and all castings are stamped cold with heat number and a serial casting number for identification during the manufacture and for record.

All ingots, shell or otherwise, are tagged on top by the insertion, while in molten state, of a sheet steel strap stamped with heat number, serial number of ingot and code number of the grade of steel.

A 2½-ton drop-bottom Tropenas converter is used, lined with silica brick next to the shell up to the tuyere blocks, the balance of the lining being a ganister mixture, composed of 18 parts of ganister, six parts of silica sand and four parts red clay, bone dry.

One-half of the rock is first put in the sand mill and, after partial grinding (15 minutes) one-half of the clay is added, all of the sand, the balance of the clay and rock in the order named. When sufficiently ground and mixed, it is wet down with thick molasses and water. The mixture is made only as needed as it is found that the results are not satisfactory after the mixture has stood too long. This mixture is used for patching, care being taken not to put the patch over adhering slag. In case of a shallow patch, which might otherwise spall off, a few large nails are inserted into the old lining to assist in holding the patch in place. Before putting on patch, the spot is daubed with thick molasses and also swabbed over with the same material when the patching is completed. Seven brick tuyeres are used. It is very important that the tuyere holes (not tuyere bricks) should always be used in the same horizontal plane when the converter is set plumb. The inside capacity of the vessel and the charge should be regulated in such a way that when blowing, the converter will be set at an angle of about 5 to 7 degrees, in no case more than 12 degrees.

Operation

Steel is blown on alternate days, running 8 to 12 blows per day, depending upon the tonnage on the floor to be poured. It is very essential to have ladle and converter thoroughly preheated before starting the first blow. The procedure in the case of the converter is as follows: At 4:30 a. m. the converter is filled with coke to well above the tuyeres and lighted up. From 5:30 to 6:00 the blast is put on, using about 1½-pound pressure. A grating is then put over the nose on the vessel and the converter burned upsidedown until 6:30 a. m. It is then turned up again and the blast put on for another half hour. This process is repeated with coke always well above the tuyere hole, until the vessel shell is approximately the temperature of boiling water. This will usually be between 8:00 and 8:15 a. m.

Type of Metal Employed

The pig iron used is high-silicon bessemer of the following specifications: Manganese not to exceed 1 per cent (generally runs about 0.15 per cent); sulphur and phosphorus not to exceed 0.035 per cent; silicon, 2.75 to 3.25 per cent, and copper not to exceed 0.75 per cent.

Crop ends are used, being purchased on same specifications as for the open-hearth. From time to time, a car is picked out which contains a large percentage of pieces of the right size. Normally, gates and risers from castings are used, but if the open-hearth is in operation it consumes all of this class of material, and the steel scrap portion of the converter charge is made up of low-sulphur and phosphorus crops, thus always keeping the sulphur well below the limit. The ferrosilicon used is the standard 50 per cent, ferromanganese 80 per cent, and ferrotitanium 15 to 18 per cent.

The cupola is 42 inches in diameter with six 7 x 12-inch tuyeres set 16 inches above the sand bottom, the charging door being 110 inches above the tuyeres. Twenty-two hundred cubic feet of air per minute are used, bringing down 5700 pounds of iron about every half hour. The full charge is 5700 pounds, charged in 1425 pounds at a time. The cupola mixture will run from 40 to 45 per cent steel scrap with a coke ratio of about one to seven. By-product coke is used which is low in sulphur and ash, a typical analysis being about 0.53 per cent sulphur and 7.75 per cent ash. Ordinarily, about 20 pounds of lime rock are added to every 5700 pounds charge. This may vary, however, ac-

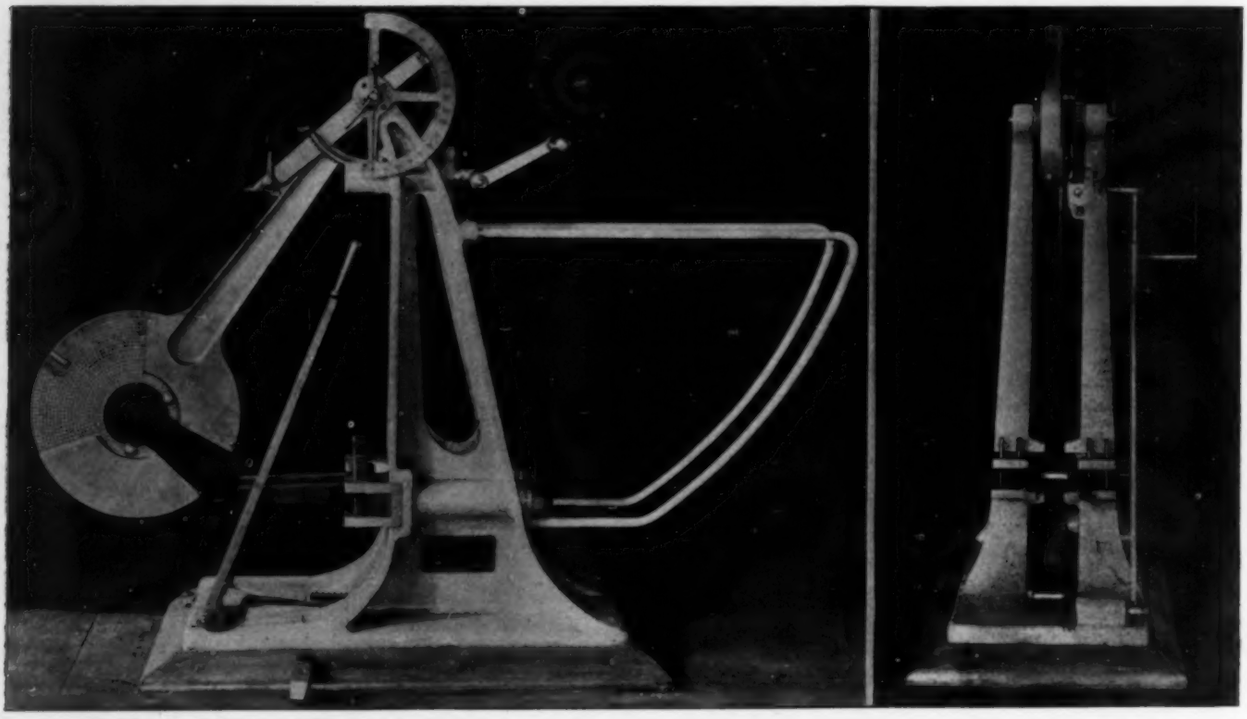


FIG. 4—SIDE VIEW OF CHARPY IMPACT MACHINE. FIG. 5— END VIEW OF CHARPY MACHINE WITH SPECIMEN IN PLACE FOR TESTING

cording to the amount of sand adhering to the pig and scrap. In case sulphur is running above the limit desired, 15 to 20 pounds of fine ferromanganese is used in the spout when tapping the cupola or lump ferro is charged in the cupola.

The cupola charge is adjusted so as to give approximately 1.90 per cent silicon; this amount of silicon is sufficient to give a very hot steel. On account of using a high percentage of steel scrap in the cupola charge, the percentage of carbon is cut down in the cupola metal, thereby shortening the blow in the converter. The theory which is also borne out by practice is that silicon will give the requisite amount of heat units by its combustion, whereas the combustion of the carbon, which results in the formation of carbon monoxide, gives off very little heat, barely sufficient to counteract the chilling effect of the nitrogen introduced with the blast and the radiation and conduction losses.

In blowing, a pressure of 4½ to 5½ pounds is maintained. The carbon flame is obtained usually about two to three minutes after the beginning of the blow, the total time per blow being 16 to 17 minutes

Sometimes, due to carelessness upon the part of some of the men, the ladle and converter will not be hot enough for the first blow, and this will be indicated by the appearance of the flame. The judicious use of 50 per cent ferrosilicon at this stage will usually overcome the difficulty, which, however, should not be encountered.

Additions to Converter Metal

The service demands the use of four ladles, one for the cupola, one to receive the weighed charge of molten cupola iron, transferring it to converter, and two ladles used for pouring the castings. They are all lip-poured ladles, operated with worm-gearing, a bottom poured ladle being occasionally used for particular work. While one heat is being poured in the molds, the other casting ladle with the necessary amounts of ferromanganese, ferrosilicon and ferrotitanium in the bottom is being preheated under an oil-fired ladle heater.

About two minutes before the finish of the blow, the ladle is lowered on the platform scale, tared, and scale weights set for necessary addition of molten cupola iron used for recarbonizing. This amount of cupola metal for recarbonizing will vary according to the size of the charge entering the converter, the calculated losses in the converter and the desired final carbon. It is found that, ordinarily, one can estimate the losses in the converter quite closely, and thus vary the amount of cupola metal accordingly, but in cases of doubt, it is the practice to weigh the blown metal poured into the molten cupola iron. The regular practice, however, is as follows: After the necessary cupola metal has been added to the ladle, the crane swings this ladle over to the converter and the blown metal is emptied into the ladle. As soon as the vessel is turned down at the end of the blow, the vesselmen throws a cupole of shovels full of dry sand on top of the slag in the vessel and then throws a brick on top of the slag just inside the nose of the vessel. When pouring the blown metal from the vessel into the ladle, the vesselman, by means of a long bar or rod resting on this brick, retains nearly all of the slag in the vessel, which slag is removed by turning the vessel upside down as soon as the ladle is swung out of the pit. The casting ladle is taken to the skimming floor, and there, by means of bent hooks, the small amount of slag is removed from the top of the steel. The steel should be hot enough at this stage to be able to hold it at least 10 minutes before starting to pour. Just before starting to pour the first mold, the thin film of slag adjacent to the lip is skimmed back, and a hot brick dropped on top of the steel, next to the lip. When pouring into the molds, a man keeps this skimming brick in place (close to the ladle lip), in this way effectually holding back the remaining blanket of slag from the lip.

In concluding the remarks concerning the converter practice, it may be well to emphasize a few points which may possibly not have been duly accentuated above:

1.—Careful selection and grading of melting stocks.
2.—Small cupola charges, thus obtaining uniform melting practice and uniform iron.
3.—Sufficient preheating of ladles and converter.
4.—Hot, quick blows.
5.—Careful skimming in converter and ladle.
6.—Holding the steel in the ladle at least 10 minutes prior to pouring.
7.—The most important requisite of all, hot steel.

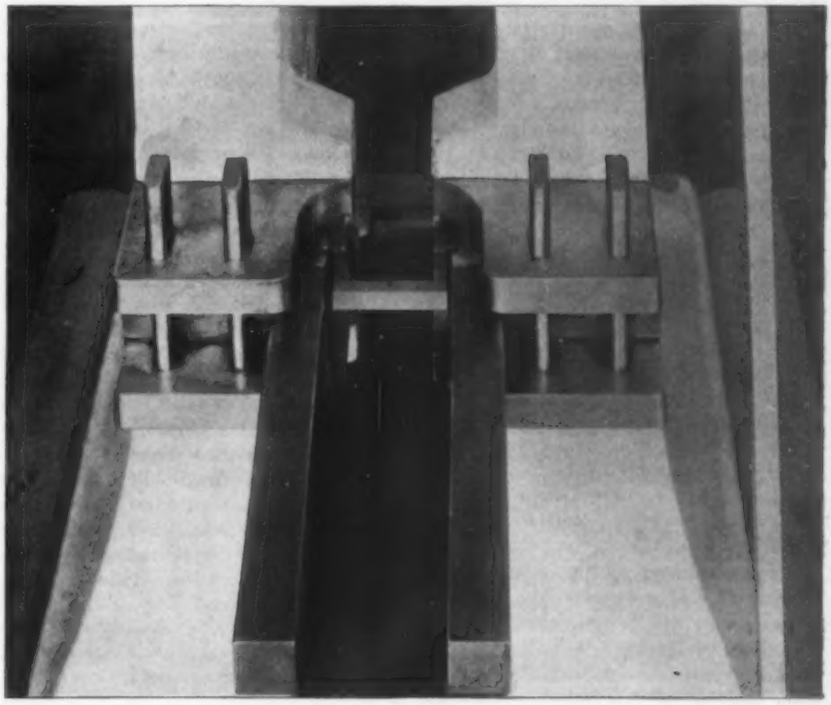


FIG. 6—DETAIL OF SPECIMEN HOLDER

The open-hearth furnace used, is, as previously stated, a 15-ton tilting furnace especially adapted for burning oil. It has but one set of checker chambers and one reversing valve. The size of the hearth is 20 x 9 feet.

The common practice in making the acid bottom is departed from somewhat inasmuch as an average of only four to six inches of bottoming sand is used. The remainder of the bottom and banks is built up of silica brick, with careful allowance made in the laying for expansion of each successive course. It is found that by making the bottom in this manner, much less trouble is experienced due to corrosive action of the slag or from excessive rust on steel scrap

The purchased materials used in making up the open-hearth charges include pig iron with silicon, 1.50 to 2.25 per

cent; manganese, maximum, 1.50 per cent; sulphur and phosphorus, not over 0.035 per cent. Plate scrap and crop ends of suitable size and shape with sulphur and phosphorus not over 0.04 per cent also are employed. An important reason for the low-sulphur specifications in case of crop ends, is because this material is used in the cupola charge for converter steel, as previously described. Other materials used are shop scrap; risers; gates, etc.; ferrosilicon, ordinary 50 per cent grade; ferromanganese, 80 per cent grade; ferrotitanium, 15 to 18 per cent titanium content, 5 to 8 per cent carbon content; aluminum, the best grade and also No. 2 aluminum running 94 to 96 per cent. The following is a typical charge: Pig iron, 7000 pounds; shop scrap, 10,000 pounds; plate scrap 5000 pounds; crop ends, 14,000 pounds. This will give a charge of approximately the following composition: Carbon, 1 per cent; manganese, 0.69 per cent; silicon, 0.60 per cent.

Order of Charging

First pig iron, next plate scrap and third heavy scrap are charged in the order named. A sufficient interval is allowed between charging the plate scrap and heavy scrap to permit the plate to soften under the heat and sag down in the furnace. It is then covered with one to 1½ barrows of bottoming sand to counteract the consequences from the rust, which results in excessive corrosive action on the banks.

A good flame during charging is maintained and to completely melt requires about 4½ hours from the time charging is begun. The furnace is charged by hand, requiring about seven men, besides the first helper. The time consumed averages about 1½ to 2 hours. From the time charging is begun until the heat is tapped averages almost six hours. The carbon in the bath, when charge is melted, will average 0.65 per cent, thus giving from 28 to 30 points of carbon to work on before adding the finals. It is attempted to adjust the flame and slag so as to eliminate one point of carbon in about three minutes. The use of iron ore in the bath to reduce carbon, after the carbon is below 0.55 per cent, is avoided if possible. In case the bath is lying too quiet and carbon not dropping fast enough, 100 to 200 pounds of crop ends are thrown in without increasing the basicity of the slag. The condition of the slag in the furnace and its character when poured into test molds for fracture tests are carefully observed. If it has the least indication of wildness and especially if the end of the heat is near, it is adjusted effectively by the addition of bottoming sand and a little loam, otherwise "blowy" castings will be the consequence.

The latter part of the refining operation is done entirely by heat, making the steel very hot and the slag as gray as possible, with a reduction of some of the silica in the slag to silicon. This reduction of silica will have to be estimated by the appearance of the test specimen and when the steel is hot enough and the carbon at about 0.38 per cent there is introduced enough ferrosilicon to give about 0.25 to 0.30 per cent silicon, the gas and air are shut off and damper lowered until carbon report is received from chemical laboratory. The ferromanganese is then added, stirring it through the bath as quickly as possible, and in from three to four minutes the heat is tapped out.

A pouring cup and runner large enough to take a full stream of metal without choking back is used in pouring all castings. Risers and gate openings are kept closed until just before pouring to prevent any dirt or foreign matter finding its way into the mold.

In making No. 3 cast steel, the attempt is made to tap at about 0.38 per cent carbon which, with the carbon taken up from the ferromanganese addition, will give a final carbon of 0.43 per cent in the heat. In other words, it is endeavored to catch carbons coming down, making due allowance for carbon increment from the ferroalloy additions.

In adding the finals there is used a variable amount of ferrosilicon, 350 pounds of ferromanganese, and 90 to 100 pounds of ferrotitanium. Sometimes a portion of ferrotitanium is replaced by aluminum These are added to the ladle during tapping out. In tapping a heat, pieces of sacks or a piece of wood block is held in the tap hole sufficiently long for the metal bath to entirely include the tap hole, thus preventing the slag from running out in advance of the steel.

Great care is used in making up stoppers and adjusting the stopper in the ladle. A nozzle is used that is double burned and very true to shape and of a size recommended by the American Foundrymen's association for the 2-inch round faced nozzle. A standard grade of graphite stopper head is used, suitable for this nozzle The stopper-head is keyed to the stopper-rod, being keyed up snugly and then released just a little The stopper rod is 1¼ inches in diameter, made up with 2-inch sleeves.

The paragraphs in the specifications governing the annealing of castings are as follows:

"All castings shall be heated at least once to a temperature not less than 30 degrees Cent. above the AC, point. If the castings are then allowed to cool in the furnace, no reheating shall be necessary, but if they are drawn from the furnace and air-chilled, they shall be reheated to a suitable temperature. Rapid cooling as in oil or water will not be permitted without special authority.

"All forgings and castings shall be heated for annealing, drawing, or other heat treatment as required as evenly as possible, and the operation shall be performed on the whole of a piece, never on a part only. During any annealing, drawing, or other heat-treating process, steel pieces should be held at the desired temperature for a sufficient length of time to insure that the heaviest part of the piece shall be thoroughly soaked at this temperature."

The furnaces employed at Watertown arsenal consist of one car bottom annealing furnace, 25 x 16 x 7 feet, with track at foundry-floor level. This unit is fired from the side into a combustion chamber, with four high-pressure oil burners; the second furnace, 15 x 7 feet 10 inches x 8 feet, is also of the car-bottom type, the tracks being in a pit bringing the car bottom to the foundry level. This furnace is also fired from the side into a combustion chamber and is equipped with two high-pressure oil burners.

System of Temperature Control

Temperature control is maintained with platinum couples which are connected to Leeds & Northrup recorders. The couples and recorders are carefully checked each week and an accuracy of 5 degrees Cent. is maintained.

The standard annealing treatment for No. 3 steel is as follows: Heating to 950 degrees Cent., holding for four hours followed by air chilling. After the completion of the chill the castings are drawn at 500 degrees Cent. This subsequent draw is considered very essential to relieve any internal strains which might be present. This temperature, 500 degrees Cent., is not high enough, however, to produce any appreciable readjustment of structure.

All No. 2 castings are annealed by heating to 900 degrees Cent., holding at this temperature for four hours, followed by furnace cooling. The work is very frequently going through the foundry in such a manner that it is not feasible to separate the No. 3 and No. 2 for the annealing operation. In this case, No. 2 is given the No. 3 treatment, namely, the air chill and draw.

The specifications state that rapid cooling such as water or oil will not be permitted without special authority. This clause appears to be justifiable. To allow promiscuous quenching operations to be carried out on all classes of work without knowing the equipment of the contracting parties might lead to serious trouble. Coupons

representing small work might be satisfactorily quenched whereas the castings represented thereby might not be quenched in a satisfactory manner. Furthermore, the dangers of cracking are always present and it would seem essential for the government to know not only the facilities but also the experience of the contractor in conducting this class of treatment before permission could be granted to heat-treat in this manner.

The principal special treatment which is sometimes employed at Watertown arsenal consists in a prolonged anneal, six to eight hours on small sections, just above the AC_1 point; this treatment has often been successful in improving the ductility of heats which have been given the standard No. 2 or No. 3 treatment. In fact, it is never used unless the standard treatment has failed to produce the desired results and in accordance with specifications, could not be given unless the castings had previously been annealed at a higher temperature.

Recourse is also had at times, in the case of some alloy castings, to a treatment similar to the standard No. 3. The first operation consists of an air chill from 1050 degrees Cent. followed by a draw at approximately 775 degrees Cent.

In certain exceptional cases either water or oil quenching from temperature ranging from 800 degrees to 900 degrees, followed by drawing, at temperatures from 600 to 700 degrees, has been resorted to.

The following figures taken from the results of tests on heats cast in April, May or June may be of some interest:

Month	No. of casting heats converter	Per cent passing 1st test	No. of heats cast O. H.	Per cent passing 1st test
April	32	86	8	87½
May	50	60	11	90
June	55	80	10	80

The per cent of heats passing the first test in May from the converter steel was lower than usual. This was due to the fact that a number of alloy steel heats were made which did not comply with the specifications after the first treatment. This specification was 55,000 pounds elastic limit, 90,000 pounds tensile strength, 15 per cent elongation and 25 per cent contraction.

In compiling the above table only those heats, all the castings of which passed the first test, were counted. If a second test was necessary, although due to a defective first specimen, the heat was considered as not passing the first test.

When a heat fails to pass the first test it is the duty of the laboratory to check the chemical analysis, make a microscopic examination of the specimens which failed and then recommended a second treatment. If, for example, the first test showed the following results: 48,000 pounds elastic limit; 90,000 pounds tensile strength; 11 per cent elongation and 14.5 per cent contraction; the second treatment would probably consist of a long anneal just above the critical range followed by furnace cooling. If the low ductility previously mentioned was due to too high carbon, which can easily be determined by laboratory examination, the second treatment would in all probability reduce the elastic limit and tensile strength increasing at the same time the ductility.

If the elastic limit and tensile strength were low on the first test while the ductility was high, the heat would probably be again air chilled but additional care taken in arranging the castings on the car so as to insure their receiving a good circulation of air when pulled from the furnace.

In meeting the prescribed physical requirements, one particular type of difficulty is often encountered to which special emphasis should be given. The following illustrations will bring out this point: Fig. 1 shows the microstructure of a specimen of cast steel at 50 and 500 diameters, respectively. This material represents the attempt of a commercial foundry to meet the government specifications for cast steel No. 3. It will be noted that this material is deficient in ductility. Attention is also invited to Fig. 2. Here again the chemical composition, elastic limit and tensile strength are satisfactory, but the elongation and contraction are very poor. Fig. 3 shows a specimen which was entirely satisfactory.

The explanation of the difference in behavior of these different heats under test is quite simple, but it is beyond the scope of present methods in chemical analysis. Microscopic examination shows that both the heats failing in ductility are contaminated with a great deal of slag.

Attention is again invited to Figs. 1 and 2. The micrographs at 500 diameters show an almost complete slag network which surrounded the original austentite grains. This network is very effective in preventing the development of proper structure by annealing and, furthermore, produces decided cold shortness and lack of ductility.

The specimen shown in Fig. 3, although far from being as free from slag as might be desired, shows a much better structure. A continuous slag network is absent and hence the better ductility. The specimens shown in Figs. 1 and 2 were undoubtedly poured from cold steel. The slag particles present in the bath at the conclusion of the blow were effectively trapped. This, as mentioned above, is due to cold metal, the slag particles not having opportunity by virtue of their specific gravity to rise to the surface.

Fig. 3 shows a specimen having a decidedly better structure with regard to slag. This test was poured from a hotter blow than either Fig. 1 or Fig. 2. The slag particles have coalesced and the network is destroyed. If this metal had been still hotter, these coalesced particles would not have been trapped.

Although the foregoing may be regarded as a hypothesis having no place in an ordinary steel foundry, it is felt that enough evidence has been gathered to remove it from the realms of theory to the domain of facts.

It might be well before passing from this portion of the discussion to state that when a specimen fails to pass the requirements of ductility and has a structure similar to Figs. 1 and 2, further annealing treatment is considered useless. The trouble is cold metal. Annealing medicine cannot cure such a disorder and the patient is doomed.

Investigations of difficulties are constantly being made and, at the present time, every effort is being put forth to improve the product of the foundry. One of the tests which has been and is now useful in this respect is described below for the benefit of those who are not familiar with it.

Fig. 4 shows a side view of the Charpy impact machine and Figs. 5 and 6 end views of the same instrument with the specimen in place for testing. This illustration also shows the form of a specimen used. In operation, the pendulum is elevated to a fixed height and then released. The specimen is struck a sharp blow and depending upon the amount of work absorbed by the specimen, the pendulum is retarded by a certain amount which is determined by the excess angle. The foot pounds absorbed by rupture can then easily be computed.

It is the practice to record this as foot pounds absorbed per square inch, using the data obtained from the small specimen in the same manner as computing the results from a standard tensile specimen. This is not rigidly true as the results obtained from different size notched specimens subjected to shock do not follow the simple laws of similarity which hold for tensile specimens. However, this method gives the significance of comparative figures which are understood by all concerned.

The following experiment serves to

illustrate the effect of varying heat treatments upon the shock strength of plain cast steel of approximately 0.30 per cent carbon and 0.62 per cent manganese. After being annealed at 900 degrees Cent. for two hours, water quenched and drawn at 650 degrees Cent., an average of seven specimens showed 185 foot pounds absorbed per square inch after being annealed at 850 degrees Cent. for two hours, air chilled and drawn at 500 degrees Cent. for two hours, an averare of eight specimens showed 153 foot pounds absorbed per square inch after being annealed at 900 degrees Cent. for two hours and furnace cooled, an average of eight specimens showed 146 foot pounds absorbed per square inch. It will be noted from these results that the water-quenched and drawn casting is superior to any other treatment as far as shock is concerned. The air-chilled casting is also superior to the furnace cooled.

Many experiments such as these are being conducted and as previously stated in this paper, it is thought that ultimately high-grade alloy castings will replace many parts now being made of forgings. Although the very term casting brings up unpleasant thoughts in the minds of many designers, it cannot be disputed that by the very nature of the method of manufacture, a casting has one decided advantage over a forging.

One Advantage of Casting

This advantage lies in the fact that the physical properties of a casting are the same in all planes if the annealing and casting operations have been properly carried out.

It is a matter of common knowledge that the physical properties of a forging are widely different in different planes. In some exaggerated cases, the elongation may be 22 per cent in one plane whereas it is practically zero in a plane at right angles. As long as suddenly applied stresses are confined to the plane having good ductility, failure will not ensue, but if by any chance, suddenly applied stresses occur in the planes having poor ductility, failure is almost certain.

The static tensile test comes far from telling all of the truth especially when the specimens are taken in one direction only. The Charpy impact test will pick out these cases of absence of ductility in certain planes and it is for this reason that its use has been successful.

Whenever abrupt section changes occur in any place, stresses will be set up under shock action, which are not usually considered by the designer. As forgings are apt to have different physical properties in different planes, disaster may result. If such parts are made of high-grade castings, which are carefully tested and inspected unforseen failures are apt to be less frequent, by virtue of their uniform quality in all directions.

In view of results obtained on the Charpy impact machine, investigation at the Watertown arsenal leads to considerable optimism in the eventual replacement of many high-grade forgings with castings. Furthermore, this replacement will result in considerable saving of time and money, when such castings can be produced commercially.

Labor Appreciates the Human Element

BY J. F. KENT

WHETHER his skin is white, black, red or yellow, man is a social animal. You can work a mule from one year's end to another and as long as you keep his stomach full he is satisfied. A man is different. On Saturday night he looks for something besides a pay envelope. You can't treat him as an animal or a machine and successfully get away with it for any length of time. He is a man and you are a man, and in that kinship lies the secret of good or bad relations.

Relationship Demands Recognition

Recognition of that kinship goes by many names, the most popular probably being "Welfare Work". No matter what you call it, however, it is the same thing; it exists in any business where men work for other men, and in any state or country. In the foundry of the American Cast Iron Pipe Co., Birmingham, Ala., we have endeavored to give this relationship proper recognition. When I first went to Alabama, a good many years ago, I heard men with experience say that negro labor was not dependable, and that the "only way to handle a negro was to take a pick handle or some similar persuasive implement and knock him in the head about twice a week". Today three-fourths of the laborers in our shops are negroes. They are as dependable as any ordinary class of labor, and in making them so the pick handle method never has been used.

At no kind of work will a man get as dirty, perhaps, as in a big pipe foundry. Therefore, one of our first steps was the construction of a brick bath-house large enough to accommodate all of the employes. In the 12 months from Oct. 1, 1915, to Sept. 30, 1916, white employes took 25,753 baths and negro employes 166,477. When our men go to and from work they are dressed in good clothes, with white collars and polished shoes. Few would imagine that they worked in a pipe foundry. The indirect value of these baths upon the negroes is beyond estimation. As anyone might surmise, whose olfactory nerves ever came within business distance of a thoroughbred southern negro on a warm day in June, the race is not particularly addicted to the bathing habit. The baths our men get at the shop, therefore, not only keep them clean, but communicate the infection to their families and their friends, with the result that the waterworks company has a growing consumption among the negroes.

We installed a medical department, which, from a small beginning, has developed until today we have a thoroughly equipped operating room, consultation room for both races, dental parlors for both races and a drug dispensary. This establishment is conducted by two doctors; one a high class surgeon and general practitioner, and the other a physician; a white trained nurse; two negro trained nurses; a dentist and a consulting board composed of several of the leading specialists of our city. Employes pay for this service at the rate of 50 cents a month for single men and $1 a month for married men. For the married man, all members of his family are entitled to the services of the department. Needless to say, this work is very far from self-supporting. Our motive in assessing the dues being to impress upon the employe some degree of its importance and prevent abuse of the system.

Must Undergo Examination

Every new man now employed must stand a thorough physical examination, and if the doctors find any condition present which might endanger the health or safety of other employes the applicant is refused employment. Injured men are given first-aid treatment at the dispensary, and when seriously injured are taken to one of the city hospitals. Some years ago we had one or two cases of tuberculosis, and we constructed out-door

A paper presented at the Boston meeting of the American Foundrymen's Association. The author, J. F. Kent, is general manager of the American Cast Iron Pipe Co., Birmingham, Alabama.

houses for the afflicted men on top of a mountain near the plant, where their recovery has been complete.

We have constructed a 3-story Young Men's Christian Association building. In charge of the association's activities are two trained secretaries, one who remains at the plant, and one who spends his time visiting the homes of the employes, where he advises them about many of the phases of their daily life, especially regarding thrift, sanitation, disease prevention, cookery, education, religion and similar subjects. This work, of course is confined to the negroes.

Under the management of the Y. M. C. A. organization is a white and negro restaurant which is open both night and day and where food is served to the employes at cost. Motion pictures are shown in the Y. M. C. A. twice weekly for both races. Other activities under the auspices of the Y. M. C. A. are a day school for negro children; employes' school for adults; Sunday school; athletics, such as base ball, foot ball, track teams, etc., and special activities such as an annual negro agricultural fair, Christmas celebrations, shop and department banquets, musical organizations, including a negro brass band and a negro chorus of over a hundred voices.

A mutual benefit association is in operation which has a thousand members out of a possible 1200, and which pays out monthly in sick, death and accident benefits an average of about $500. A few statistics afford a quick way of covering the ground. They include a period of 12 months, as follows:

	White	Negro
Men's bible classes	600	1,733
Boys' bible classes	564	....
Sunday school	3,754	547
Socials for men only	545	1,315
Moving picture shows	4,564	16,030
Educational classes	1,035	3,537
Library books used	839	40
Shower baths	25,753	166,477
Number served at restaurant (mixed)	201,604	
Number served in dining room	7,154	
Amount deposited in savings bank	$1,514.71	
Taught to read and write	13	
Attendance at athletic games, players	3,953	
Attendance at athletic games, spectators	12,030	
Medical, surgical and special cases treated at medical dispensary	21,697	

Miscellaneous Phases of Welfare Work

There are a few other phases of this welfare work which I might mention incidentally, such as a week's vacation given the shop last summer on full pay; a suggestion box plan by which every employe is given an opportunity to make suggestions for the more economical or safe operation of the plant and for which cash prizes are awarded; a cash bonus of from 5 to 10 per cent on each employe's salary for the year 1916; as high or higher wages as are paid by any other employer of labor in the district; financing of homes for white employes and the construction of a model negro village with nice homes for rental to the negro employes; active and aggressive safety work in every department; and, finally, intertwining all these activities and keeping them before the employes' minds is a monthly newspaper published by and for the employes at the company's expense.

We believe implicitly that a man expects, and has a right to expect, something more than that which he gets in his envelope, and that is what we are trying to give him.

Science in France

IN a paper "Organization of Scientific Research in France", presented by Henry Le Chatelier to the French Academy of Sciences, the author bitterly complains of the slight estimation in which science is apparently held by society and government in France. He states that men of science are rarely consulted on measures of public interest, even those most directly connected with science, such as, for example, problems of organization of public education. He claims that science is not appreciated in France to the same extent as it is in Germany. There the captains of industry are proud of the right to prefix the title of Doctor. In France a man who would follow the same custom would make himself ridiculous. In England industrial magnates are quite flattered at being invited to preside at meetings of scientific societies. Not so in France.

Curiously, even while we in America consider our state of research as backward, Le Chatelier, whose name is quite well known in this country as that of the inventor of the pyrometer and other instruments and the author of many valuable papers on metallurgy, cites the United States as one of the examples of a progressive country where research is generously endowed.

In France there is one magnificent institution of research, the Pasteur institute, of which the country is proud, but only one. As regards laboratories created specifically for industrial research, there is only the experimental station of the coal mines committee at Lievin, maintained by the Coal Mines Co. While this laboratory is very well equipped, it does not make much of a showing as compared, for example, with the numerous laboratories of the German metallurgical, mining, ceramic and cement industries.

A field in which still more remains to be done is the creation of private-plant laboratories serving the needs of individual concerns. According to the statement of the writer, a good many industries completely neglect the use of laboratories and none know how to fully profit by them.

When one comes to consider ways and means of remedying this deplorable situation, he finds that the main difficulty is the skepticism of the educated classes in French society with respect to the reality and the usefulness of science.

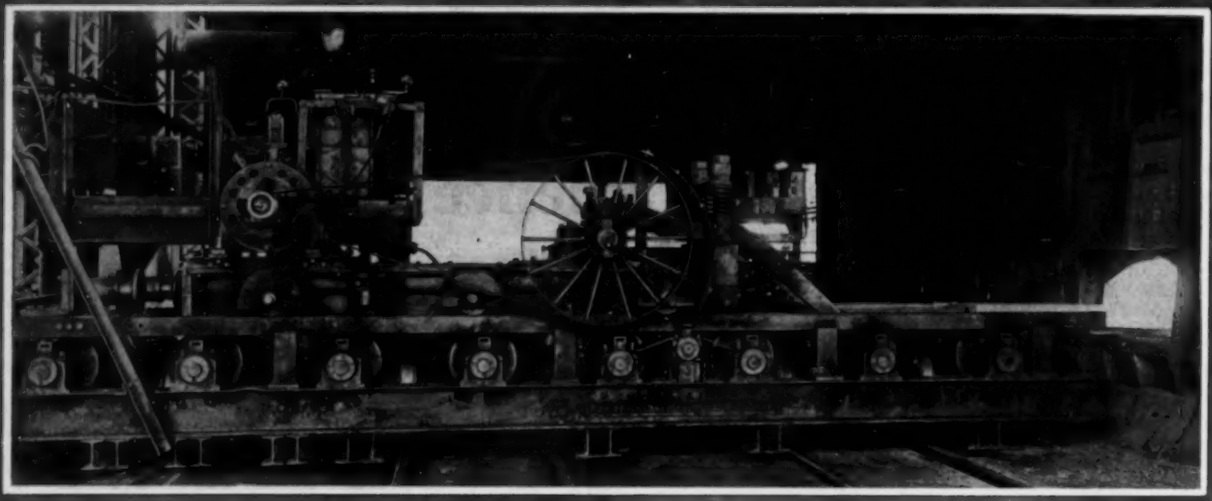
One often hears engineers, even those who have arrived at high positions in the industry, say: "Our study of science has never been of any use to us. It is nothing but good mental gymnastics, the same as fencing exercises are good bodily, even if one does not intend to use the art for actual purposes of fighting. Perhaps even the study of Chinese might prove of more value than that of mathematics."

Such statements are a clear proof of an incomplete scientific formation. The war, however, has thrown a vivid light on this subject and has shown France, even if somewhat late, the exact state of affairs.

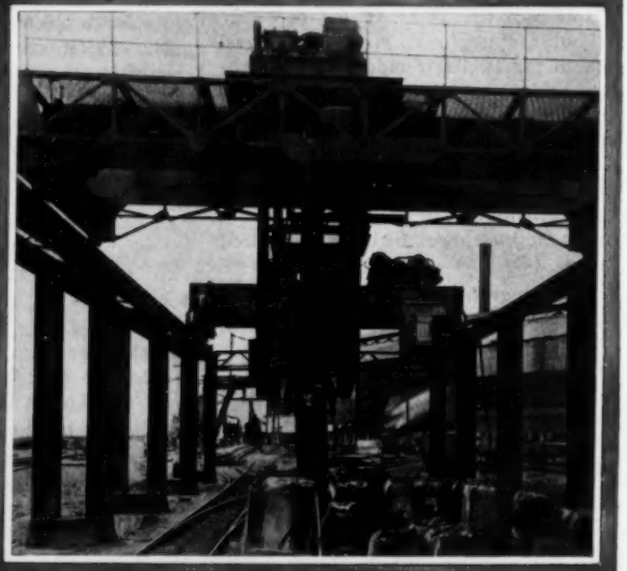
The principal error in the past has been that science was reduced to a collection of facts and laws; that is, to only the results of science, and in the presence of the immense number of problems facing the industry only a few of these results acquired with so much effort could be utilized in the course of the career of an engineer. Therein lies the explanation of the apparent uselessness of the study of science. But, side by side with results, there is the method of science, that which produced these results, and this method can be of daily application. It is to training in this way that the teaching of science should be exclusively devoted. It is not enough to clutter the mind with a variety of bits of knowledge; what should be done is to give it a certain formation.

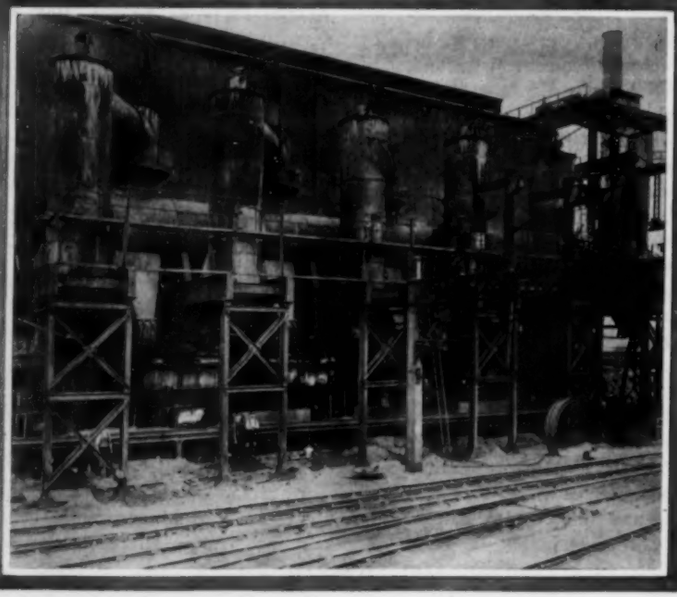
This point of view being admitted, certain consequences immediately result therefrom. The basic method of physical sciences is the experimental method, and it is acquired in the laboratory and not in front of a blackboard. Therefore, the extension of laboratories, or rather their better utilization, as there are already a good many of them in universities, should apparently be the dominant problem in all reforms of our system of tuition.

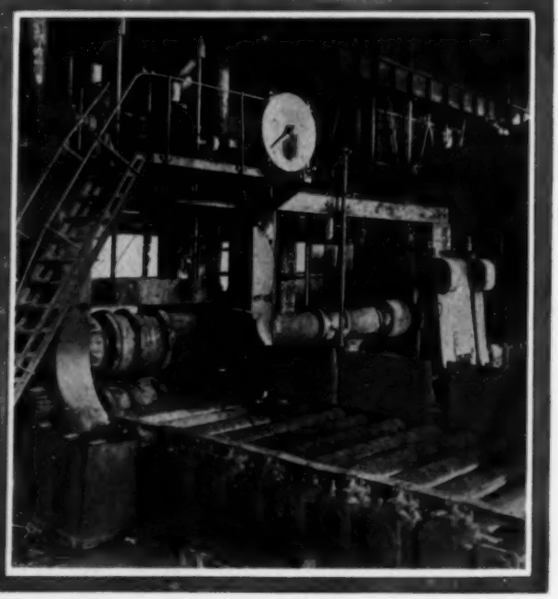
Britain's Steel Mills Carry



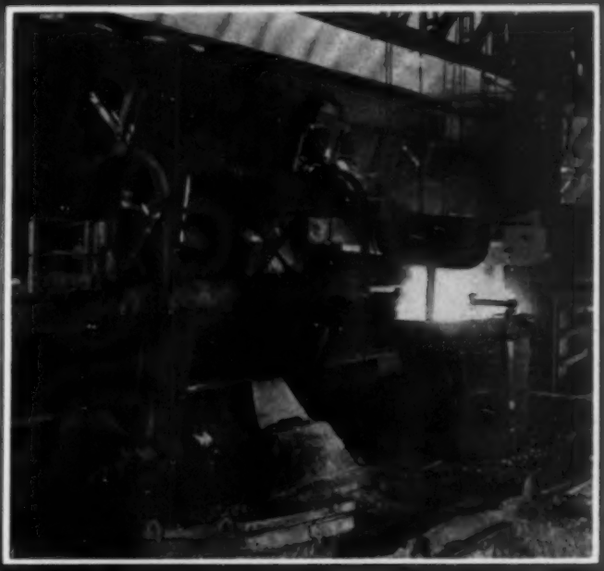
BEFORE the outbreak of the world war in 1914 England was producing 7,000,000 tons of steel a year. Impelled by the exhaustive demands of the army and navy, this capacity has been increased until today the English mills are making steel at the rate of 10,000,000 tons annually. Extensions now in progress at various plants will bring the production of the country up to 12,000,000 tons a year within a short time. The illustrations on this and on the facing page show some characteristic views of one of England's large steel plants—the Cargo Fleet Iron Co., Ltd., Middlesboro. This is one of the many English steel plants whose capacity has been greatly increased by the keen demands of war. Selective service has maintained efficiency of personnel.



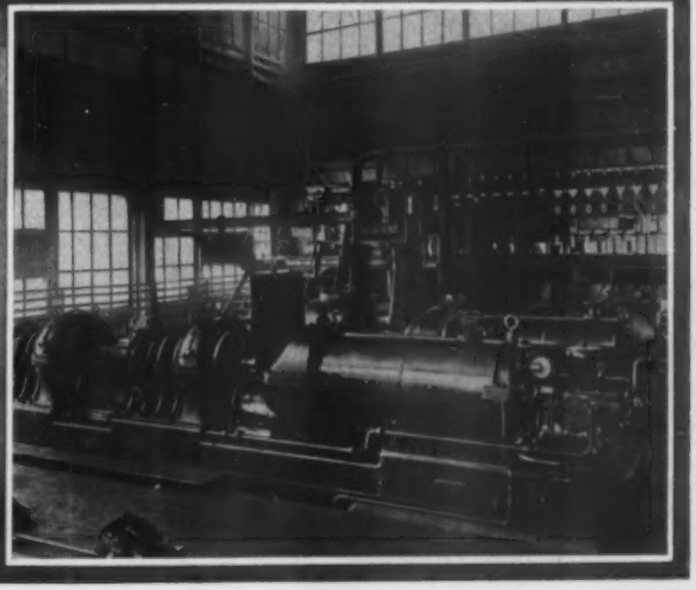




Lion's Share Of War Burden



SECOND only to steel among the vital necessities of modern warfare are the various high explosives. Trinitrotoluol, obtained from by-product coke ovens, now is made in enormous quantities by English steel plants. Previous to the war, this product was imported almost entirely from the enemy. At the left is shown the tapping side of a Talbot furnace. The construction of these open-hearth furnaces, as shown by the illustration, is somewhat unique, judging from American standards. Gas from the blast furnaces operates a battery of seven blowing engines at the Cargo plant. Electric energy is generated by two high-speed, turbo-generator sets. The switchboard and regulating apparatus are placed in a gallery at the rear of the engine room.



How Malleable Iron Has Improved

In This Article the Author Presents the Results of Tests of Thousands of Malleable Iron Test Bars Produced by Many Foundries—A Steady Improvement of the Metal is Shown

BY ENRIQUE TOUCEDA

I HAVE been asked to prepare an outline containing data that might assist in indicating the progress that has been made during the past few years in the improvement of malleable iron. It is believed this can best be done by tabulating the results of many hundreds of tests, starting from the time they began to be systematically conducted, presenting the averages in suitable form. While prior to November, 1915, tensile test bars were sent me by the various concerns for whom I am consulting engineer, with frequency, but at odd intervals, it was not until the date referred to that it was decided to send on test bars daily which would fairly represent the product of each day's run. The record that will first be presented consists of the average ultimate strength and elongation of all bars received during the last two months of 1915; of all bars received during the whole of 1916, and of all bars received during the first five months of 1917.

Table I

Summary of Tests of Malleable Iron

	Per cent of bars under 40,000 lbs. ultimate.	Per cent of bars between 40,000 and 42,000 lbs. ultimate.	Per cent of bars between 42,000 and 44,000 lbs. ultimate.	Per cent of bars between 44,000 and 46,000 lbs. ultimate.	Per cent of bars between 46,000 and 48,000 lbs. ultimate.	Per cent of bars between 48,000 and 50,000 lbs. ultimate.	Per cent of bars between 50,000 and 52,000 lbs. ultimate.	Per cent of bars over 52,000 lbs. ult.
1915—Covering last two months:								
Ave. ult. lbs. per sq. in.	5.80	9.47	12.38	21.44	21.15	16.22	11.05	2.49
Ave. elong. per cent in 2 in.	4.91	6.55	7.38	8.87	9.47	10.17	11.27	13.38
1916—Entire year:								
Ave. ult. lbs. per sq. in.	2.57	3.65	7.36	13.64	18.26	21.57	16.61	16.76
Ave. elong. per cent in 2 in.	5.78	6.88	7.48	8.33	9.14	10.28	11.61	12.72
1917—Covering first five months:								
Ave. ult. lbs. per sq. in.	1.68	2.75	6.72	12.83	20.53	20.22	16.78	18.49
Ave. elong. per cent in 2 in.	5.78	7.37	8.20	8.72	10.11	11.51	12.97	14.94

All bars ½-inch diameter, and similar in all particulars to the tensile test bar recommended by the A. S. T. M. in its specifications for malleable iron.

To the end that you may obtain a clearer idea of what these tests indicate than if you were furnished simply with the average ultimate strength and elongation of the total number of bars received during these various periods, the results have been classified into various grades, as shown in Table I. About 18 separate companies furnished these bars.

Looking over my records prior to the year 1914, in which there is abundant data, it was found that the average ultimate strength and elongation would approximate about 38,000 pounds ultimate and 3.50 per cent elongation, respectively, though there are occasional instances of a 46,000 and 48,000 pounds ultimate with a 6 or 7 per cent elongation. On looking over these old records it is found that the test bars then submitted were of many different dimensions varying anywhere from ½ to 1 inch in diameter, while some were square and others rectangular in section. For this reason it is hardly possible to gather from this data any conclusions which can be compared accurately with the material that has passed through my hands since the beginning of 1914.

It will be noted in Table I that the proportion of the 1915 bars that failed to test up to 40,000 pounds was 5.80 per cent. In 1916 this ratio dropped to 2.57 per cent, and in 1917 to 1.68 per cent. Only 2.40 per cent of the bars exceeded 52,000 pounds per square inch ultimate in 1914, as against 16.76 in 1916 and 18.49 per cent in 1917. In 1914, 72.35 per cent of the bars exceeded 44,000 pounds per square inch ultimate, while in 1915 86.42 per cent, and in 1917 88.85 per cent exceeded that figure.

When the great difficulty that has been encountered by the manufacturer within the past six months in securing suitable coal and iron for his purpose is considered, the continued improvement in 1917 is certainly quite remarkable, as the handicap has been very large.

Another important fact that can be gathered from the data in Table I is that malleable iron of good quality is very different from other ferrous products in one particular, in that its elongation increases with its ultimate strength. Prior to the discovery of this fact it had invariably been assumed by all writers on this subject that the reverse was true. While it is believed the foregoing data unmistakably demonstrate the fact that a healthy improvement in the quality of malleable iron has taken place within the past few years, they do not tell the whole story. One of the most serious shortcomings in malleable iron in the past has been its lack of uniformity. I consider the improvement that has been accomplished in this direction within the past few years to have much more far-reaching effect on the user of this metal, and to be of greater importance to him than the ability of the founder to obtain high strength and ductility. A high ultimate strength is not always specified owing to the belief on the part of some that when the ultimate strength is in the neighborhood of 42,000 pounds per square inch the machine tools can be speeded up to a considerably higher rate than is possible when working with metal having ultimate strengths around 48,000 to 50,000 pounds. This is a matter we will not discuss at the present time. If the individual record of many of the concerns, the results of whose physical tests are included in

A paper presented at the Boston meeting of the American Foundrymen's association. The author, Enrique Touceda, is consulting engineer, Albany, N. Y.

the data in Table I were examined, it would be found that they have made a practically uniform iron day in and day out for a period covering many months. Those whose showing is more erratic are improving in this particular from month to month.

The figures in Table II were taken from records covering iron made during June. These data demonstrate the uniformity in the quality of the material from many consecutive heats, illustrating the fact that the manufacturer of malleable iron who is well posted in malleable practice has full control of his product. The day of "hit or miss" has passed.

Record Elongation

Table III, however, records a run of 17 consecutive heats made during February, of this year. The average ultimate strength of the 17 bars is 52,784 pounds and the average elongation is 17.88 per cent, in spite of the fact that two of the bars contained a slight shrink which made them fail prematurely. In this set there are four bars with over 21 per cent elongation; one with 24.22 per cent and one with 27.34 per cent. We have tested many bars within the past two years having an elongation as high as 24.00 per cent, but it is believed that 27.34 per cent is the record elongation of any malleable iron test bar ⅝-inch diameter yet produced. I might add that the reduction of area of this bar was 22.71 per cent. The data in this table are furnished because they clearly demonstrate what is possible to achieve along the line of quality and uniformity, the goal toward which we are aiming.

As I have made mention of no tensile tests aside from those made on the standard tensile test bar recommended by the American Society for Testing Materials, it may be of interest to make record of the results of tests on bars with different-sized sections. Some four months ago six sets of bars cast from the same heat and of the following sizes were sent me:

Set No. 1, 12 bars, ½-inch diameter.
Set No. 2, 6 bars, ¾-inch diameter.
Set No. 3, 6 bars, ⅞-inch diameter.
Set No. 4, 6 bars, 1 -inch diameter.
Set No. 5, 6 bars, 1⅛-inch diameter.
Set No. 6, 6 bars, 1¼-inch diameter.

The *average* results are as follows:

Set marked	Ultimate strength lbs. per sq. in.	Elongation in per cent
No. 1— ½-inch.....	52,141	15.62
No. 2— ¾-inch.....	48,062	10.54
No. 3— ⅞-inch.....	47,107	9.37
No. 4—1 -inch.....	47,317	11.56
No. 5—1⅛-inch.....	47,148	9.69
No. 6—1¼-inch.....	46,592	9.69

The foregoing table should serve as a complete answer to those who maintain that when malleable iron exceeds ⅝-inch it cannot be made strong or ductile. Our experience indicates that provided a casting is sound, high quality malleable iron can be produced today just as easily in sections around 1¼ inches thick as in the case of ⅝-inch sections. With increased thickness there naturally comes increased difficulty in removing all the shrinks, but we have within the past few years made great strides in the direction of securing perfect soundness in thick and intricately designed castings.

In short great progress has been made in improving the physical properties of malleable iron solely and only because of a determination on the part of the manufacturers to systematically improve each step in the process. It is believed that the figures placed before you indicate that they have more than achieved a fair measure of success.

Table II

Data Demonstrating Uniformity

JUNE RECORD, FOUNDRY A

Ultimate strength, lbs. per sq. in.	Elongation in per cent
46,032	8.59
50,631	8.59
46,700	8.59
50,213	8.59
46,917	7.03
48,344	7.03
47,324	6.25
54,028	9.38
46,540	8.59
48,761	7.03
51,012	9.38
49,255	7.81
47,706	7.81
52,422	7.81
50,733	9.38
47,444	9.38

JUNE RECORD, FOUNDRY B

Ultimate strength, lbs. per sq. in.	Elongation in per cent
50,338	12.50
51,734	16.41
52,343	18.75
52,011	15.63
50,937	13.28
50,700	10.94
51,938	14.84
49,899	14.84
51,476	14.84
52,780	11.72
50,400	9.38

Table III

Tests Reveal Average High Quality

FEBRUARY FOUNDRY RECORD

Ultimate strength, lbs. per sq. in.	Elongation in per cent
55,032	21.09
53,908	21.09
54,706	21.09
52,010	17.19
50,321	10.94*
54,867	17.19
54,283	13.28
53,537	21.09
55,804	27.34
51,380	11.72
51,978	24.22
52,506	17.97
52,477	17.19
50,097	14.06
49,910	12.50*
52,204	17.97
52,311	17.97

*Test bar broke in fillet.

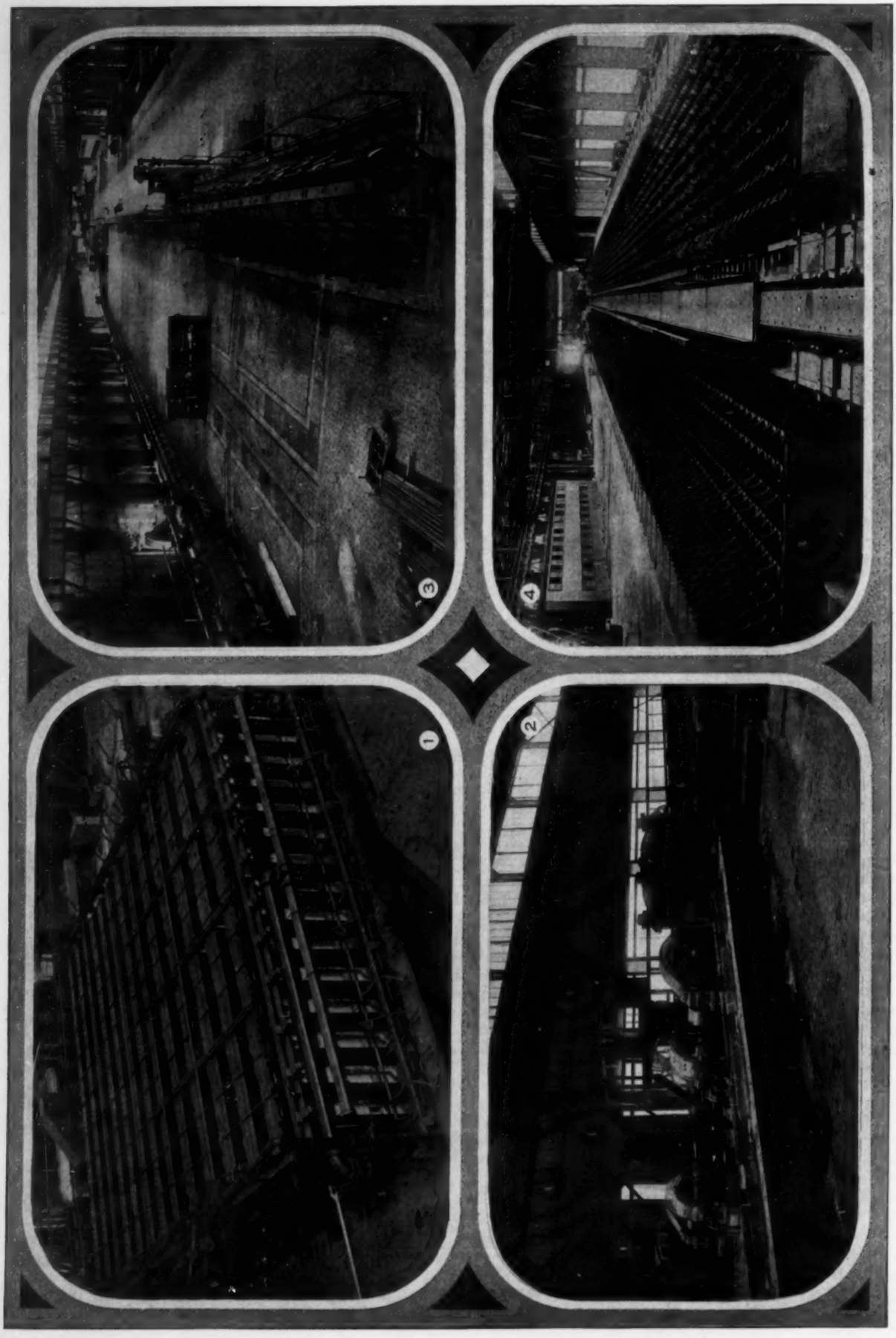
Manganese Production

The shortage of manganese for the steel industry in the United States which has resulted from the disturbed conditions arising from the war is stimulating the domestic production of manganese-bearing minerals, but the output is far from sufficient to make the industry independent of foreign sources. In a recent bulletin of the United States geological survey it is stated that if all the domestic deposits had been worked to capacity in 1915, and if these ores had been reduced, but one-fifth of the demand of the steel industry could have been satisfied.

The first effect of the war was to reduce the imports of these ores from Russia, India and Brazil, says the bulletin. Those from Russia and India were severely curtailed. This reduction continued during 1915 and it was not until that year that the domestic production was stimulated. For 1915 the number of shippers and the ore were three times those of 1914. Activities at present indicate that the number of shippers and the marketed production for 1916 will be three times those of the previous year. Most of the increase in mining in this country during the years 1915 and 1916 was derived from deposits previously known, but lately several new sources have been discovered, and, upon investigation, seem to be promising.

Curtailment of English exports of ferro-manganese to the United States has been met by an increased domestic production. The increase has been accomplished by the entrance of new makers into the field rather than by increased production by those already established. The number of makers of ferro-manganese increased from two in 1912 to five in 1914, and of spiegeleisen from three to six. The number of makers of ferro-manganese in 1915 was eight and several new ones were added in 1916. The production of spiegeleisen has increased slightly and new producers steadily are entering the field.

The machinery and equipment of the Landover Motor Truck Co., Chicago, has been moved to Marinette, Wis., where the company has taken a three-year lease on all of the buildings of the former Marinette Iron Works, excepting the foundry, and has the option of purchasing at the end of one year.



VIEWS OF 12-INCH BAR MILL RECENTLY COMPLETED BY YOUNGSTOWN SHEET & TUBE CO.

Fig. 1—Top View of Furnace Fig. 2—Motor-Driven Roll Straighteners Fig. 3—Run-Out Tables, Shears, Bundling Racks and Scales Fig. 4—Cooling Beds for 12-Inch Mill

Completes a Second Merchant Mill

New 12-Inch Mill Installed at Plant of Youngstown Sheet & Tube Co. to Supplement 9-Inch Mill Built in 1916—Will Roll 10,000 Tons Per Month

THE dominating factor that led the officials of the Youngstown Sheet & Tube Co., Youngstown, O., to approve a contract for a 12-inch bar mill was the enormous demand for merchant bars during the past year and a half. The new mill was built by the Morgan Construction Co., Worcester, Mass., which also furnished the 9-inch bar mill described on page 777 of the April 5, 1917, issue of THE IRON TRADE REVIEW.

The 12-inch mill is designed to take 1¾ x 1¾ to 3 x 3-inch billets in 30-foot lengths and roll them into finished material ranging in size from ½ to 2 inches for rounds and squares, 1¾ to 4½ inches in width for flats, and 1½ to 3 inches for angles. The capacity of the mill under ordinary operating conditions is 10,000 tons of average sections per month.

The billet stockyard at the north end of the mill is housed in a 90 x 594-foot building of steel construction. Two standard gage railroad tracks are provided for unloading material. The stockyard is served by a 15-ton double-hook traveling crane, which is utilized to transfer the billets destined for the new 12-inch mill from the storage piles to the receiving table. This table, which is of standard construction, delivers the billets to the furnace-charging conveyor. The latter is 82 feet long and is driven by a 25-horsepower motor made by the Crocker-Wheeler Co., Ampere, N. J. It conducts the billets to a 30 x 30-foot continuous heating furnace of the Morgan suspended-roof type. Coke-oven gas piped from the by-product coke plant at East Youngstown is employed for heating the billets.

Electrically Operated Pushout

The heating furnace is equipped with a Hawthorne twist pushout, which eliminates the twisting of the billet that was quite noticeable in the earlier methods of withdrawing. The pushout is actuated by a 13-horsepower, reversing motor with a maximum speed of 650 revolutions per minute. When thoroughly heated, the billets are discharged from the furnace and received by the roughing mill. This mill contains a five-stand continuous train of 14-inch rolls. A dividing shear, driven by a 15-horsepower Westinghouse motor, is located between No. 2 and No. 3 stands. All roughing and finishing rolls are driven by a 44 x 50-inch unaflow steam engine of the poppet valve type. This engine, which develops 2100 brake-horsepower and runs at from 65 to 100 revolutions per minute, was built by the Nordberg Mfg. Co., Milwaukee, Wis.

The 12-inch finishing mill consists of two independent sets of two stands each, placed in a zigzag position to one side and in front of the roughing mill. Each stand is equipped with a separate runout table. The independent set of rollers on each table is driven by a 50-horsepower, reversible motor operating at 530 revolutions per minute under maximum load. The material passing through the last finishing stand is carried on a hot-runout table to a 300-foot, horizontal cooling bed of the universal double-pass type. The bar is then moved intermittently by fingers over the cooling bed and deposited on the cold runout table.

Between the cooling bed and the front-shear table, which lies directly beyond, is a roll straightener operated

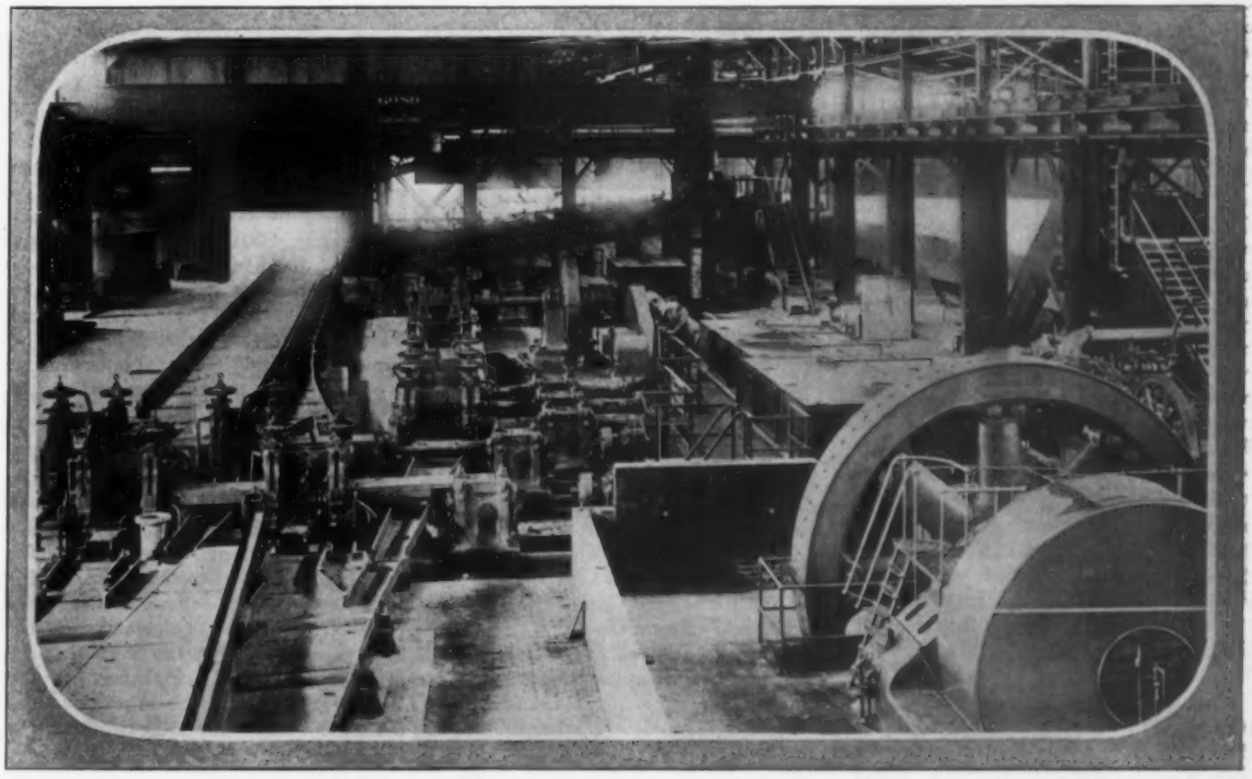


FIG. 5—GENERAL VIEW OF 12-INCH BAR MILL FROM CRANE OVER COOLING BEDS

by a 60-horsepower, direct-current motor. All driving gears are encased in separate oil-tight and dust-proof housings. No gears are attached to the ends of the straightener rolls. This machine removes any distortions caused by the cooling bed oscillating fingers. When the mill is rolling angles and shapes, the straightener is used; when rolling straights and flats, it is moved to one side and a section of rollers installed. In either case little time is required to make the change.

The material passes to a 300-foot front-shear table driven by two 25-horsepower motors built by the Crocker-Wheeler Co., Ampere, N. J. Here the stock is cut by shears driven by a 15-horsepower motor. The desired length of material passes to the 75-foot back-shear table, driven by a 15-horsepower motor made by the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. The stock is automatically placed into scale pockets where it is weighed and bundled. A 15-ton, double-hook crane transfers these bundles to a 100 x 396-foot warehouse at the south end of the building.

The warehouse contains four depressed railroad tracks for loading purposes and a 75-ton platform scale, 40 feet long. The main 12-inch mill building is 160 feet wide and 1150 feet long. A 15-ton single-hook crane serves the mill. The warehouse and mill cranes have a span of 96 feet. Three crane repair platforms are located in the building. All buildings are of steel construction and with the exception of the billet yard, have the Pond type of roof with swinging windows of steel sash, equipped with a modern operating device. Scrap shears are located near the mill end and at the side of the cooling bed, and at the south end of the building in the rear of the back-shear table and scales is a cross roll straightener for straightening rounds. Electrc current for operating the mill is generated at the rod and wire works power house and distributed to two separate control houses in the mill, where all of the control equipment is located. The current is wired into busses within the control houses, each control panel having an individual connection to the bus. From these two control houses all wiring to motors is carried in fiber ducts imbedded in concrete beneath the floor.

According to official statistics recently published, 10,535 tons of iron pyrites, valued at $23,731, were obtained from mines in the United Kingdom in 1915. In addition, 903,467 tons, chiefly cupreous iron pyrites, valued at $7,635,108, were imported. The report further states that 418,791 tons of burnt cupreous iron pyrites were treated at metal extraction works in Great Britain, from which, it is estimated, 15,077 tons of metallic copper, 1,924 ounces of gold and 335,033 ounces of silver were extracted.

To Test Concrete Building

Wrecking operations in clearing the site for the new union passenger station in Chicago is affording opportunity for unusual tests of a reinforced concrete structure of modern construction. Among buildings to be removed to make room for the new station is the 10-story building erected in 1909 by the Western Newspaper Union. The 8-inch floors of this building are reinforced longitudinally and diagonally, according to approved methods.

A section of this floor is to be tested to destruction. Preparations are being made to load this section 34 x 36 feet with about 700 tons of pig iron in the test.

The tests are under the auspices of the University of Illinois, the Portland Cement association, the Pennsylvania railroad, the Illinois Steel Co. and the Universal Portland Cement Co. The work is in charge of Professor A. N. Talbot of the university; Paul Kircher, civil engineer; W. E. Ensign, H. F. Gommerman, E. E. Cress, and F. E. Richert.

Preparations are completed to make this the most exhaustive test ever made of a modern reinforced concrete structure and its result will be awaited with much interest by engineers. Probably much light will be thrown on many points not yet thoroughly understood in this comparatively new branch of engineering.

It is an interesting fact that destruction of comparatively new buildings in Chicago is giving opportunity for much research. A year ago the Reliance building, a steel frame structure, was wrecked to make room for another and opportunity was afforded to observe the condition of steel after 10 years' service.

Crystal Structures

The crystal structure of aluminum and silicon has been determined by passing a narrow beam of monochromatic X-rays from a Coolidge tube with molybdenum target through a continuously rotated tube of the finely powdered metal and photographing the diffraction images of the slit. The positions and intensities of the lines in the photograph are compared with the theoretical values for different possible arrangements of atoms until an arrangement is found which represents completely the observed lines.

A tabulation of the lines observed and the corresponding spacing, calculated from the angle of the line and the wave-length, the theoretical spacing of the assumed lattice, and the index of the plane producing each line, is given.

Aluminum, which has usually been considered to belong to the isometric system, is shown to be tetragonal. The unit of structure is a centered rectangular prism, with a square base. There is an atom at each corner and one in the center of the prism. The atoms per unit parallelopiped are two.

Silicon has a lattice identical with that of the diamond, two face-centered lattices intermeshed, the one being displaced with reference to the other along a cube diagonal a distance of one-fourth the length of the diagonal. The number of atoms per unit cube is eight.

Composite Mine Car

Forty mine cars of the composite type were recently delivered to the Republic Iron & Steel Co., by the Orenstein-Arthur Koppel Co., Koppel, Pa. The flanged plate construction and the heavy wooden floor with pressed steel bumper cap is designed to eliminate joints and rivets found on older types of cars. The wooden floor with the heavy pressed steel bumper car takes up the shocks resulting from heavy service and can be renewed during the life of the car if necessary. These cars are for use in a rotary tipple and have fixed ends. The capacity is 75 cubic feet.

Making Gun Mounts

The Lawrence Guard Mount Co., Springfield, Mass., recently incorporated, has received orders for 1,000 gun mounts for the United States government. The company is also instructed to continue the manufacture above 1,000 and to make deliveries as frequently and in as large numbers as possible. Much of the work will be placed in New England machine shops for the present. The company is said to be planning the erection of an assembling factory in Springfield.

For heat treating and annealing the great advantage of the electric furnace lies in the accurate control and the uniformity of temperature essential for securing uniform results from day to day. The thermal efficiency varies greatly with the size and capacity; a furnace of 60 kilowatts capacity heating 250 pounds of metal per hour to 1200 degrees Cent. has an efficiency of 50 per cent. In annealing work a 600-kilowatt 3-ton furnace heating to 900 degrees Cent. has an efficiency of 90 per cent.

Government Speeds Up War Orders

Equipment Contracts Closed Cover Every Phase of Military Necessities and Are Widely Distributed—Ship and Aircraft Contracts Overshadow All Others in Number and Magnitude—New Plants Being Built

STANDARDIZED production has become the government's chief war policy. In the duplicated manufacture of ships and their equipment, aeroplane engines and parts, ordnance and war material in general, main reliance is being placed for the rapid development of quantity output of essential supplies; likewise for the quickest participation of the nation in the present struggle on a telling scale. Letting of a growing number of contracts for standardized as well as interchangeable equipment, illustrates the fact that the government's plan for the building of standardized steel and wooden ships, graduaally is being extended to other branches of industry, now the subject of its expansive plans. Contracts being placed for war materials in general, are of large proportions and well distributed and have been conducive to the promotion of business in many lines not directly associated with the carrying on of war. Building operations, for example, at the present time are almost entirely dependent upon business resulting from war activities. The price of steel and the restrictions surrounding purchases of this material are causing the adoption of wood and temporary type of construction. But the size of many of these contracts has been such as to keep business moving and operating as nearly as possible to the plane of pre-war standards. Contracts let for supplying the sinews of war cover an extensive field. Those recently placed call for aviation motor parts, aviation motors, antiaircraft gun equipment, electric power units and apparatus of many other kinds.

Buys Electric Furnaces

The American Bridge Co. just has booked a contract for three heroult electric furnaces for the Watertown arsenal. These will include one 2-ton and two 6-ton furnaces, all of which are expected to turn out five or six heats each 24 hours. This makes a total of 11 furnaces which the American Bridge Co. now is building for the government. In addition to those for the Vatertown arsenal, three are to be installed at the new government projectile plant at Charleston, W. Va., and one at the naval gun plant at Washington. Four are to be installed at the Hess Steel Co.'s plant at Baltimore, which is working on government contracts. The steel for the furnaces to be installed at the Watertown arsenal and at Washington, will be used for the manufacture of short howitzers and other ordnance. The boring of steel castings for the production of guns is a recent innovation in this country. The Crucible Steel Co. recently adopted this method after it had been in practice in Great Britain for several years.

A contract for furnishing the Emergency Fleet Corp. with 55 marine boilers within one year's time has been taken by the DePere Mfg. Co., DePere, Wis., which established a boiler and structural shop in the plant of the former Lyons Boiler Works about 18 months ago. The company closely is affiliated with the Joliet (Ill.) Bridge & Iron Works.

To Build Gun Works

The Bullard Engineering Works, Fairfield, Conn., recently incorporated with $50,000 capital by officials of the Bullard Machine Tool Co., Bridgeport, Conn., has a contract with the government for the making of 6-inch cannon beginning April 1, 1918. The Bullard company was selected by the government, after an exhaustive investigation, as one of the four plants to develop organizations for the making of cannon. The new plant will consist of a main machine shop, of brick and steel, 2-story, 700 feet long and 180 feet wide, having two full length crane sections, 60 feet wide, and two side bay with galleries, 30 feet wide, making a building equivalent to 700 feet by 240 feet in area. There is also being erected a basement at one end, 180 feet long by 180 feet wide, for power house, locker rooms, etc., and an extra 1-story, 280 x 60-foot storage building. Seven traveling cranes and some of the largest machine tools ever shipped into Connecticut will be installed. The plant will cost $1,000,000 and approximately 1500 men of the highest type of mechanical skill will be employed. Approximately three years' work is assured.

Building Great Destroyer Plant

The Squantum aviation field in Greater Boston will be the site of the greatest destroyer plant in the world, which will be built for the government by the Fore River Shipbuilding Corp., Quincy, Mass. Work on the $90,000,000 plant is already under way and it is expected it will be nearing completion by the end of the year. Steel, for the building of 46 of the largest, fastest and best-armed destroyers ever laid down, is scheduled to begin to arrive at the plant not later than Jan. 15. The contract for building the plant has been let to the Aberthaw Construction Co., Boston, and it will be directed by officials of the Fore River corporation. The Fore River corporation also will erect a turbine plant in Buffalo, which will cost $2,500,000 and will construct a plant in Providence, R. I., to cost $1,500,000. The destroyers' hulls will be built at Squantum. The boilers will be made in Providence, the turbines in Buffalo, and will be shipped to Squantum as rapidly as completed. The Fore River corporation will employ about 13,500 additional men in the Squantum, Providence and Buffalo plants. From 8000 to 10,000 men will be employed at Squantum, 3500 in Buffalo and 1000 in Providence. Twelve men are already canvassing New England cities for employes. The Fore River corporation will build practically every part of the destroyers, the only parts which will be furnished from outside will be the guns, torpedo tubes, pumps, electrical apparatus and heaters.

To Build Aircraft Motors

Lincoln Motor Co., recently incorporated with $1,500,000 capital by Henry M. Leland, Wilfred C. Leland and associates, to manufacture aircraft motors for the government, has purchased a 50-acre site for its new factory in Detroit. Plans for the buildings are in the hands of the Walbridge-Aldinger Co., engineers and builders. The Lelands, father and son, maintain offices in the Dime Bank building here and state that special transportation facilities are being provided to rush materials to the site of the new plant.

The Sumner Iron Works, Everett, Wash., through T. B. Sumner, president, announces that a contract just has been closed with the government for the construction of marine steam engines, which entails an expenditure of $240,000.

Priority Tightens Grip on Industry

Operation of System Virtually Permits Government to Commandeer Output of Iron and Steel and Allied Plants—Task of Priorities Committee Tremendous—Present Facilities Are Inadequate

WASHINGTON, Oct. 9.—Exercise of priority powers of the government is, in effect, the commandeering of every plant in the country producing or using iron, steel, the allied metals and their products. Study of the priority regulations and the system, as explained in THE IRON TRADE REVIEW last week, by which the priorities committee of the war industries board has begun to operate brings no other conclusion. Manufacturers will find, when they begin producing under priority orders, that such is the case.

Commandeering is a word with a harsh sound and except in a few instances is avoided in government usage, but the full meaning of the word, as far as industry is concerned, virtually is being shown under the priority system. Commandeering powers given the President and the secretaries of the war and navy departments, where government war orders are involved, have been conferred upon the priorities committee through the formers' approval of the committee's action.

Depends on Administration

Upon the committee's ability to administer the powers equitably will depend just how harsh the application will prove to be. As is pointed out, business judgment of the highest type will be required to conduct this system successfully, which is to supplant the old law of supply and demand.

Powers to commandeer for army and navy needs have been extended now through the voluntary acceptance of government-fixed prices to the allied armies and navies and the general consuming American public. Refusal to accede to the government's one-price-for-all policy and fill orders as classified and directed by the priorities committee means the actual taking over of such plants as the government may require for its own needs at prices much lower than those agreed upon. Of course, such refusal would allow the manufacturer to name his own prices to the allies and the public, but the penalty would be public disfavor and the charge of being unpatriotic.

Whichever way the iron and steel manufacturer now turns, he runs up against the commandeering grip. The government can refuse to license his products for export; after Oct. 15 it can refuse to supply ships to carry his manufactures; it can otherwise divert railroad cars which he would engage for inland transportation of either his raw materials or his finished products; and, on government orders, it can punish him or his organization for failure or refusal to carry out his contracts.

Producers Freely Co-operating

But the majority of iron and steel manufacturers are not contemplating bucking the government, not because they know such a course would be unwise, but because they are too patriotic. The producers are even willing, or, to coin a phrase, some possibly unwillingly willing to operate at a loss rather than do anything to embarrass the nation in its fight against Germany.

As before pointed out, the task of the priorities committee is gigantic. No member of the committee is yet able to comprehend just how much it will have to do. It is generally conceded, however, that the present facilities and equipment, both as to men and material, are far too inadequate. These are expanding every day and will have to expand much more. The system is but in its infancy.

The committee's plan contemplates an elaborate system of bookkeeping by which all the business of the manufacturers will be recorded. This doesn't mean that the government is going to supervise the financial end of the contracts, but the tonnages involved, the contract data, the classification applications and certificates will be entered. It would be easy, however, for the government to ascertain from the records just what the financial transactions are.

Since publication of the committee's system in THE IRON TRADE REVIEW last week, a new question has been raised. It is asked and explained in the following statement given by a member of the committee:

"The several departments of both the army and the navy of the United States government, as well as the Emergency Fleet Corp., may file orders or place contracts with the same manufacturer. All of these contracts may be entitled to a Class A-1 rating, that is, the highest priority rating. This being true, these orders will ordinarily be filled in the order in which priority certificates are issued and filed. Suppose a manufacturer has 50 unfilled Class A-1 orders or contracts on its books. When the ordnance or engineering department of the war department places an order more urgent than some or all of the 50 existing orders, the priorities committee will consider such order and determine its relative urgency with respect to existing order and give it such place on the list as they determine it should occupy whether at the head of the list, half way down the list or elsewhere. The committee's records are so kept that they can tell at a glance just what orders each manufacturer has and how they are classified and hence are enabled to make a re-classification from time to time to meet rapidly changing conditions. The system is simple yet elastic, and enables the priorities committee to make readjustments to meet rapidly changing conditions without demoralizing the operation of industrial plants or seriously disturbing industrial conditions.

This also applies to subsidiary classification ratings.

Contracts may be made by manufacturers without reference to priority. All contracts take Class C rating until lifted to Class A or Class B. As pointed out before, army and navy and shipping board orders are typical examples of Class A ratings, although some may come under Class B and even others left in Class B. A typical Class B rating would be a railroad's order for steel rails, or locomotives, etc., although rails or locomotives for General Pershing's forces in France undoubtedly would be given high-up priority rating.

Pomerene Bill Remains on the Left-Over List

Washington, Oct. 9.—Congress adjourned last Saturday, much to the relief of everyone, with the Pomerene bill, which would take over the entire iron and steel industry from mine to mill and operate it by the government, still in committee. It was left with a sub-committee of the interstate commerce committee, composed of Chairman Newlands and Senators Pomerene and Cummins. Both Senators Newlands and Pomerene declared, shortly before adjournment, that no definite action had been taken to change the measure as drawn by

Mr. Pomerene. When congress convenes in regular session, two months from now, the bill still will be before the senate and subject to action by the committee. Much may happen in that time but from present indications it is clear to many that the Pomerene bill is not required to run the steel industry to the government's satisfaction during the war with Germany. The government practically has all the authority needed, it is generally admitted. If it hasn't the two months will show what is lacking.

Building Part of Liberty Airfleet Abroad

Washington, Oct. 9.—Motors and parts for the fleet of more than 20,000 airplanes the United States is to use against Germany are being built abroad as well as in Amercia, according to announcement of Secretary Baker last week. While this has not been known generally, builders of tools and machinery who have been called upon to supply this equipment have been aware of the fact for some time. Approximately one-fourth of the airplanes being built under the $640,000,000 aviation appropriation are to be assembled from parts being made abroad. No announcement has been made of the location of these plants but it is presumed they are in France or England, possibly both. Many of the accessories necessary to aircraft service are being made near the front.

The machinery for these plants abroad and the materials with which they are building completed planes come chiefly from America, as do most of the machinists and engineers directing the construction. France has been so depleted of men and materials that this has been necessary even of the stone and sand for the foundations of the factories.

Secretary Baker's statement in part is as follows: "The types of airplanes now in process of manufacture cover the entire range of training machines, light high-speed fighting machines and powerful battle and bombing planes of the heaviest design.

"It has been necessary greatly to develop and expand the aircraft industry in this country. This work of increasing the output of existing manufacturing establishments, creating new plants, and providing tool, gage and jig equipment for great quantity production, has required time and the months of the summer have been, and the early fall will be, devoted to this essential groundwork. Under the direction of the aircraft board there is being accomplished an international standardization in the tests of materials and their specifications, so that through a unification of the demands upon this country there may be full utility of our resources."

Navy Workers Raised

Washington, Oct. 9.—During the closing hours of the extra session of congress a law was enacted increasing the pay of petty officers of the navy by approximately $250.000. The pay as disbursed under the bill will be as follows: First class enginemen, $45; second class, $40; first class blacksmiths, $65; second class, $50; first class coppersmiths, $65; second class, $50; first class patternmakers, $65; second class, $50; first class molders, $65; second class, $50; chief special mechanics, $127, and first class, $80; and the base pay of second class machinists, mates and water tenders, $45. In addition to establishing new rates of pay, the bill creates the second class blacksmiths and provides appointments or enlistments in the ratings may be made from enlisted men and from civil life, according to the qualifications of the men and the regulations of the navy.

Fuel Shortage

Is Crippling Detroit Industries—City Becoming Aircraft Center

Detroit, Oct. 8.—A scarcity of coal and coke which already has resulted in the closing down temporarily of several plants including the Michigan Malleable Iron Co., is the outstanding feature of the industrial situation in Detroit and surrounding territory. Concerted action has been taken by the city and board of commerce to induce the government to relieve the situation by modifying the priority shipping order which is sending coal to the northwest. Among the big plants dependent on the Michigan Malleable Iron Co., are the Ford Motor and Timken-Detroit Axle companies, both engaged in government work.

Many new companies for the manufacture of aircraft motor parts and engines are being organized and the city is in a fair way toward attaining leadership in this new industry. The city now is doing a war business of $250,000,000 in trucks, aircraft and munitions, based on calculations of leading bankers. Detroit manufacturers and users of iron and steel do not believe the new government prices will retard operations or affect wages in any way.

Plans have been completed and work is well under way for the construction of four 4-story buildings each 960 feet long, which will house the newly-organized Lincoln Motor Co., of Detroit. The company will manufacture the standardized liberty aircraft motor for the government. Henry M. and Wilfred C. Leland, former heads of the Cadillac Motor Car Co, who are now directing the operations of the Lincoln Motor Co, are preparing to place orders for machinery equipment

Building operations on the site of the proposed blast furnaces for the Ford Motor Co., on the Rouge river, Detroit, are being expanded by the George A. Fuller Co., which has the general contract for the work. It is expected actual construction of buildings will start in the spring.

Several additions to the Henry Ford & Son, tractor plant in Dearborn, Mich., are being completed. Most of the product is now being shipped to England for assembly.

Michigan Copper & Brass Co., of which Alonzo P. Ewing recently was appointed general manager, is completing a large addition to its Detroit plant in Detroit.

Smith, Hinchman & Grylls, engineers, have let the general contract for an addition to the plant of the Fisher Body Co., Detroit, to the A. J. Smith Construction Co.

The Leonard Construction Co. is building a foundry for the McCord Manufacturing Co. to cost $10,000.

The Briscoe Motor Corp., Jackson, Mich., is putting out a new 1-ton truck.

The Saginaw Malleable Iron Co. of Saginaw, has run off its first heat.

The Corrugated Bar Co. has the contract for the reinforced concrete work on the Wells-Fargo Express Co. warehouse in Detroit.

The Buhl Stamping Co. has moved into its plant in Detroit, occupying six acres upon which the company expended $500,000.

The Doble-Detroit Steam Car Co. has been granted permission by the Michigan securities commission to sell $2,500,000 of its $10,000,000 of stock in Michigan. The company recently acquired the old plant of the Bolles Iron Works, according to President C. L. Lewis.

Peter R. Rossello has been appointed architectural director for the construction of the new plant of the Air-O-Flex Automobile Corp. Trucks and cylinders will be manufactured.

Officials of the Hudson Motor Car Co. have formed the Essex Motor Co., with paid-in capital of $500,000 to manufacture a new type of motor car. W. J. McAneeny is president; R. B. Jackson, vice president; R. Barit, treasurer, and J. L. Vette secretary. Directors include the above and R. D. Chapin, F. O. Bezner and A. H. McCornack.

The Brown-Hutchinson Iron Works has the steel contract for the new Burroughs Adding Machine Co.

Construction of a $3,000,000 steel and concrete bridge from Detroit to Belle Isle will be voted on Nov. 6.

Men of the Iron Trade

Personal News of a Business Character Regarding the Men of Affairs of the Industry

FRED L. WOLF, who has been chosen secretary and treasurer of the American Institute of Metals, has had a varied experience in the field of chemical engineering. He was born at Elmore, O., May 12, 1885, and in 1892 moved with his family to that city. Upon his graduation from Toledo high school in 1904, he entered the University of Michigan, where he graduated in 1908 with the degree of bachelor of science in chemical engineering. Mr. Wolf then entered the employ of the Detroit White Lead Works as a chemist. He resigned from this position a year later to become a chemical engineer at Cobalt, Ont. In 1911 he entered the employ of the Ohio Brass Co., Mansfield, O., as a chemical engineer, and later became manufacturing engineer, a position which he now holds. Mr. Wolf is a member of the American Chemical society and the Alchemist society of the University of Michigan.

W. T. Burns has been named tractor engineer for the Timken-Detroit Axle Co., Detroit.

Charles Hart of the Delaware River Steel Co., Chester, Pa., has been elected a director of the Chester National bank.

Mortimer Bryans, assistant manager of the London office of the American Vanadium Co., has returned to this country.

Stephen S. Maples, treasurer of the Blickensderfer Mfg. Co., Stamford, Conn., has been elected its president, to succeed the late George C. Blickensderfer.

Louis W. Carver, purchasing agent for the Chester Shipbuilding Co., Chester, Pa., has accepted an appointment in a purchasing capacity with the United States shipping board.

B. F. McMahon has been appointed sales agent in charge of the sheet and plate department of the Bethlehem Steel Co., succeeding Frank Landon, resigned.

Tracy F. Manville has been named district manager of sales in charge of the newly established New York branch sales office of the Columbia Steel & Shafting Co., Pittsburgh. Mr. Manville has been identified with the finished steel industry for several years and for the past three years has been associated with the company's eastern sales department at Boston.

James H. Hood, Belmont, Mass., who was appointed director general of construction in France for the

FRED L. WOLF

Stone & Webster Engineering Corp., Boston, has arrived in that country.

C. E. Knoeppel, New York, addressed the Oct. 10 meeting of the New England Foundrymen's association, Boston, on "The Importance of Foundry Costs".

John M. Dennis and Robert D. Hopkins have been named to succeed Henry M. Keith and Edward S. Hyde, resigned as directors of the Baltimore Tube Co.

George F. Allerdice, vice president of the Brier Hill Steel Co., Youngstown, O., who had been convalescing for some time at Atlantic City, N. J., following an operation, has resumed his business duties.

Arthur D. Fiske, for 33 years employed by the American Steel & Wire Co., in Worcester, Mass., has been appointed assistant division freight agent in charge of traffic in the Worcester district, effective Oct. 1. The appointment was made by President William P. Palmer in appreciation of long and faithful service.

J. D. Rauch, formerly treasurer of the American Steel Dredge Co., Fort Wayne, Ind., and more recently engineer for the Wayne Oil Tank & Pump Co., has been made manager of factory sales for the latter company.

Edmund Barany, who has become associated with the Cleveland Twist Drill Co., Cleveland, has assumed the duties of mechanical engineer and assistant to the general superintendent.

J. D. Beall, for the past two years manager of factory sales for the Wayne Oil Tank & Pump Co., Fort Wayne, Ind., has been named manager of the new branch office established in Cleveland.

Frank Parrish, formerly assistant general purchasing agent of the American Bridge Co., Pittsburgh, has been named purchasing agent of the Canadian Steel Corp., Ojibway, Can. Mr. Parrish will be located at Ojibway.

H. A. Richmond has resigned his position as president and technical expert of the American Emery Wheel Works, Providence, R. I., to become managing director and treasurer of the General Abrasive Co., Niagara Falls, N. Y.

Edgar I. Mills has taken a position in the iron and steel export department of the Federal Export Corp, New York. Mr. Mills previously had been associated with the American Steel Export Co., New York, for several years past.

Max E. Biefeld has been elected secretary and treasurer of the Otto Biefeld Co., Watertown, Wis., manufacturer of boilers, structural iron, machinery and castings, to fill the vacancy caused by the death of Richard Biefeld.

Bruce S. Cramer and Clifford A. Kay are president and vice president, respectively, of the newly organized Cramer-Kay Machinery Co., which recently opened offices in the Newhouse building, Salt Lake City, Utah.

The new company will serve Utah and contiguous territory.

Paul L. Keiser has severed his connection with the Pottstown, Pa., plant of the Eastern Steel Co. to become president of the Pottstown Steel Products Co., a new company whose plant at Pottstown is nearing completion. Rea Morria, who for a long time has been with the National Tube Co. at Pittsburgh, will be secretary and treasurer of this company.

E. B. Hotchkiss, of the American Steel Export Co., has sailed on a trip to France, Italy and Spain in connection with a number of very large engineering problems. He will make certain investigations in these countries for his company and also act as a special representative of the engineering department in that part of the world.

George M. Davies, formerly assistant superintendent of the Mahoning Valley Works, Youngstown, O., and for the past nine years superintendent of the Inland plant of the Republic Iron & Steel Co., at East Chicago, has been named works manager of the latter plant succeeding Oscar W. Black, who recently resigned to become works manager of the Fulton Iron Works Co., St. Louis.

Alba B. Johnson, president of the Baldwin Locomotive Works, has been elected president of the Standard Steel Works, Burnham, Pa., a subsidiary of the Baldwin Locomotive Works. Mr. Johnson succeeds William Burnham, who was elected chairman of the board. Samuel M. Vauclain has been made senior vice president; Robert Radford, vice president and treasurer, and W. J. Pugh, secretary.

Edward F. Carry, president of the Haskell & Barker Car Co., Michigan City, Ind., has been made director of operations of the shipping board. He will be in charge of the government's merchant fleet. He had been a member previously of the shipbuilding wage adjustment board. His duties with the shipping board will begin Oct. 15, when all American merchant vessels will be requisitioned for service under government direction. He will have three assistants to manage affairs on the Atlantic, the Pacific, and the Gulf of Mexico.

Major-General George W. Goethals has been elected president of the Wright-Martin Aircraft Corp., and will at once take active part in directing the corporation's affairs. Since his retirement as general manager of the shipping board, General Goethals has been engaged principally in undertakings of his engineering company, Goethals, Jamieson, Houston & Jay, 40 Wall street, New York. As head of the airplane company, he will continue to act in an advisory capacity on projects in which his firm is interested.

Samuel A. Benner who has resigned as general sales manager of the American Steel Export Co. to become vice president of the Federal Export Corp., New York, has been tendered a farewell dinner by his old associates. H. M. McAteer, president of the American Steel Export Co., in presenting to Mr. Benner a gold cigar case in behalf of the officers of the company, expressed his regret at Mr. Benner's withdrawal. Members of the sales department of the comnany presented an ebony cane to Mr. Benner.

H. E. Hiltz of San Francisco, district engineer for the Portland Cement Association, Chicago, has been elected general manager, with headquarters in Chicago, to suceed J. P. Beck who died recently. He is a graduate of the University of Pennsylvania and has had railroad experience with the Mexican International, the Philadelphia & Western and the New York Central railroads. In 1913 he became road engineer of the Portland Cement Association, and two years later was made district engineer at San Francisco.

Burwell S. Cutler, of Buffalo, has been confirmed by the United States senate in his appointment as chief of the bureau of foreign and domestic commerce, department of commerce. Mr. Cutler, who is well known in manufacturing circles in western New York, came into the bureau six months ago at a nominal salary to assist in putting the organization on a thoroughly business basis. He was made first assistant chief, but since the resignation of Dr. E. E. Pratt, has been acting chief. He was born in Buffalo and finished his scholastic education at Lake Forest University and Harvard. For 15 years he has been president of an important Buffalo manufacturing company.

Edgar S. Nethercut, recently elected secretary of the Western Society of Engineers, Chicago, is a graduate of the University of Wisconsin, class of 1889. In 1893, after several years experience as draftsman, he was made chief engineer of the Paige Iron Works, and in 1908 became track expert in the valuation department for the Public Service Commission, New York. Later he was employed in the valuation of track for the Detroit United Railways. In 1911 he opened offices in Chicago as consulting engineer and from 1914 to 1917 he was in charge of valuation of track and rolling stock of the Washington Railway & Electric Co., Washington. On June 11 of this year he was given a commission as major in the engineer officers' reserve corps, from which he resigned to become secretary of the Western Society of Engineers.

Mining Engineers

Meet in St. Louis—Interesting Papers on Iron and Steel

(*Staff Correspondence*)

St. Louis, Oct. 10. (By wire.)—With a rousing patriotic session, the fall meeting of the American Institute of Mining Engineers opened at the Planters hotel, Monday afternoon. Dinner was served following the opening sessions. The first technical sessions were held Tuesday on the boat en route to the Herculaneum smelter of the St. Joseph Lead Co., St. Joseph, Mo. Supper was served on the boat and a special meeting of the war materials committee of the institute was held while en route. A number of interesting papers on the production of lead were presented at the Tuesday session. They are as follows: "The Tredinnick-Pattinson Process", and "Lead Mining and Smelting at Galetta, Ont.", by William E. Newman; "The Metallurgy of Lead Ores in the Lower Mississippi Valley", by Herman Garlichs; "The Media Mill, Webb City, Mo.", by H. B. Pulsifer; and "Salt in the Metallurgy of Lead", by Oliver C. Ralston, Clyde E. Williams, Marvin J. Udy and G. J. Holt.

Simultaneous sessions were held Wednesday afternoon on ore deposits and iron and steel. Among the papers on iron and steel which were read are the following: "The Ferrous Iron Content and Magnetic Susceptibility of Some Artificial and Natural Oxides of Iron", by R. B. Sosman and J. C. Hostetter; "Zonal Growth in Hematite, and Its Bearing on the Origin of Certain Iron Ores", by R. B. Sosman and J. C. Hostetter; "The Tayeh Iron Ore Deposits", by Chung Yu Wang; "Manganiferous Iron Ores of the Cuyuna District, Minn.", by E. C. Harder; "The Supposed Reversal of Inheritance of Ferrite Grain Size from that of Austenite", by Dr. Henry M. Howe; and "Some Unusual Features in the Microstructure of Wrought Iron", by Henry S. Rawdon.

Mr. Harder's paper was published in the Sept. 27 issue of THE IRON TRADE REVIEW. Thursday will be spent in the Joplin, Mo., lead district, and Friday in the Tulsa, Okla., oil fields. A special train has been provided to accommodate the party on this trip.

Strike Ties Up Ship Work

Continued Idleness of Thousands of Steel Workers Paralyzes Seattle Industrially—Government Working for Quick Settlement

SEATTLE, Oct. 6.—Ninety-one plants, including machine shops, boiler works, brass foundries, iron foundries, blacksmith shops, pattern shops, and 16 shipyards, are involved in the extensive labor outbreak in this city which centers about the shipbuilding industry. Ten thousand metal trade workers with a total pay of about $1,000,000 a month, walked out Sept. 29. In the plants that have settled with the unions, 5500 men are at work. The Skinner & Eddy Corp., builders of steel ships, and employing 2500 to 3000 men, is one of the larger plants that has signed up with the union.

The walkout includes the steel construction men who have been laid off as one of the results of the walkout of the carpenters and woodworkers from the shipyards several weeks ago in a sympathetic strike in behalf of the timberworkers against ten-hour lumber. More than 3500 steel construction men were out of work before the metal trades strike went into effect, the sympathetic lumber boycott having crippled three large steel shipbuilding plants to that extent. Of the 10,000 men going out, 9100 were employed in the plants of the Seattle Construction & Dry Dock Co.; the Ames Shipbuilding & Dry Dock Co., and J. F. Duthie & Co. In addition to these, the strike affects the 13 wooden shipbuilding plants and embraces all their metal trade workers.

I. W. W.'s Have Threatened

The situation has been ominous throughout the northwest for several months. The Industrial Workers of the World have been making threats of violence in the way of destroying crops, machinery of plants and other similar acts. For some time they have been sponsoring a strike in the logging camps and lumber mills for an eight-hour day. The government acted promptly with these radicals, throwing their leader, James W. Rowan, in jail at Spokane. After his arrest the organization began to lose power and the strike in the lumber mills and logging camps began to collapse. The timber workers still are conducting a drive for an eight-hour day and this is the reason for the sympathetic strike against 10-hour lumber in the shipyards. The lumber situation is clearing notwithstanding this drive and at least 45 per cent of the mills now are operating at 75 per cent normal. Not over one per cent of this 45 per cent is working on the eight-hour schedule. Journeymen and mechanics have been receiving from $4 to $5.25, and there is scarcely any limit to the wages paid for piece work, this running as high as $10 and $15 a day. The Puget Sound navy yard at Bremerton has been paying $4.40 for machinists and molders, but under the new scale is paying $5.04.

Thirty incompleted steel and wooden ships valued at $132,000,000 and aggregating 146,300 tons deadweight cargo capacity have been tied up in the metal trades strike which in conjunction with the lumber boycott has paralyzed 70 per cent of the port's shipping industry.

A few hours after the metal trades wage workers walked out of the three big steel shipbuilding yards the United States government began to set its forces in motion. Everett Marcy, chairman of the wage adjustment committee of the United States shipping board telegraphed the metal trades council arranging for a conference with the strikers and employers.

Strike Ends, Mills Resume

After a strike lasting 10 days, switchmen employed by the Elgin, Joliet & Eastern railroad, a subsidiary of the United States Steel Corp., returned to work Oct. 8. The men struck for a heavy increase in wages, but without the sanction of their labor organization and the only effect was to delay operations at the Gary and South Chicago plants of the Steel corporation. On the settlement of the strike, these mills began operating again at full capacity, made possible by the normal movement of raw material and finished product by railroad.

Obituaries

CRAIG RIDGWAY, well known to the steel industry as founder of Craig Ridgway & Son, manufacturer of hydraulic elevators, died at his home in Coatesville, Pa., on the morning of Sept. 28, in the eighty-ninth year of his life. Death was caused by a stroke which he suffered on the previous Saturday, the second within a period of two years.

Mr. Ridgway was born on July 20, 1829, at Crosswicks, N. J. He first came to Coatesville in 1863, when he accepted in trade for his New Jersey farm, the William Dripps Foundry & Machine Shop, located in West Coatesville. Possessing good sound business judgment combined with natural mechanical ability, he made the foundry a success almost from the start. Turbine water wheels were the chief product. In 1872 Mr. Ridgway moved his foundry to its present site along the Brandywine in order to be close to a huge manufacturing district which several Coatesville citizens were contemplating. In this area sprang up the foundations of the present Lukens Steel Co. and Worth Bros. Co.

Mr. Ridgway was held in high esteem in his native town, being popularly known as "the grand old man". He, together with Capt. Ash, laid out the original boundaries of the borough. He was a school director for 59 years and councilman for several terms. He is survived by his two sons, William H. and Ellis B. Ridgway, who have been active in the management of Craig Ridgway & Son for many years.

Royal C. Peabody, president of the Combustion Engineering Corp., New York, died at his home in that city a short time ago.

E. J. Krause, sales agent in charge of forgings of the Bethlehem Steel Co., South Bethlehem, Pa., mysteriously was killed from ambush in South Bethlehem recently. Mr. Krause was 61 years of age.

Ebenezer J. Hill, representative in congress of the Fourth Connecticut district, who died at his home in Norwalk, Conn., recently, was at one time secretary and treasurer of the Norwalk Iron Works Co., in that town.

Albert Gallatin Wheeler Sr., aged 63 years, died recently at Chicago. He was the builder of the freight subway in Chicago, and assisted in the construction of the underground electric traction systems in Washington and New York.

Arthur F. Luke, former treasurer of the United States Steel Corp., died Sept. 29 in the Massachusetts general hospital, Boston, following an operation, aged 64 years. At one time he

was treasurer of the National Tube Co. and when the Steel Corporation was formed became its treasurer, resigned in 1902 to become a member of a brokerage firm. Later he became the head of the banking firm of Luke, Banks & Weeks.

Frank B. Williams, for 35 years an employe of the American Steel & Wire Co., in the Worcester, Mass., district, and at one time superintendent of the Fair Haven, Conn., works, died at his home in Shrewsbury, Mass., recently, aged 61 years.

William Douglas Richards, a member of the firm of Houghton & Richards, Boston, iron and steel dealers, died suddenly from apoplexy while on the way to his home in Winchester, Mass., Oct. 3. He was born in Columbus, O., Aug. 18, 1848.

W. Lester Walker, aged 45, of Tarentum, Pa., general manager of the Allegheny Steel Co., died in the Allegheny General hospital, Pittsburgh, Sunday afternoon from acute dilatation of the heart. Mr. Walker had been associated with the Allegheny Steel Co. since 1909, when he accepted a position in the order department. Promotion was rapid and after holding the positions of general superintendent and general sales manager, he was made general manager of the plant.

Great Program

Of Construction Will Engage Tennessee Company for Several Years

Birmingham, Oct. 9.—Two or more years of steady construction and the expenditure of millions of dollars will be called for by the elaborate program of expansion which the Tennessee Coal, Iron & Railroad Co. has inaugurated in the Birmingham district. Production of finished forms of steel will be greatly enlarged by the improvements. At the present time the company is producing upwards of 90,000 tons of steel monthly.

Announcement is made that there is under way at present the following new construction:

Electric-driven blooming mill.

One hundred and ten-inch mill to roll plates up to and including 96-inch widths.

Structural mill to roll structural shapes from 15 inches down. This mill will also be capable of rolling small rails and the larger range of bars.

Remodeling of open-hearth furnace at Ensley to change process from duplex to triplex with joint object to extend production of duplex basic phosphate slag for fertilizer to three times present capacity and also to provide more flexible method of manufacturing steel.

Mixer at Ensley, which, in connection with remodeling Little Belle furnace at Bessemer, will furnish low phosphate-recarburizing metal for the Ensley open hearth.

New ladle house at Ensley for relining iron ladles.

Turbo-blower for increasing quantitative blast at the Bessemer converting mill.

New reversible engine for the blooming mill at Ensley.

Improving Bayview mine to increase production from 1600 to 2600 tons per day.

Steel Men Honor Memory of McKinley

STEELMAKERS from all parts of the country who have contributed liberally to the fund for the new McKinley memorial, attended the dedication, Oct. 5, of the imposing marble structure at Niles, O., which represents a tribute from people in all walks of life to the late President. The memorial stands only a few rods from the modest frame house where William McKinley was born, Jan. 29, 1843. At the ceremonies, Miss Helen McKinley, a sister, unveiled the commanding 12-foot statue of the late President which stands in the court of honor. Ex-President William H. Taft, George B. Cortelyou, McKinley's secretary and later cabinet member, and Joseph G. Butler Jr., president of the McKinley Memorial Birthplace Association and to whose efforts the building of the memorial is due, made brief speeches at the dedication. Telegrams expressing regrets of necessary absence were received from Senators Pomerene and Harding, Secretary of War Baker and Governor Cox.

The Niles memorial is a Georgia marble building, 232½ feet long, 136 feet deep and 36 feet high. Utilitarian as well as artistic, it contains a large auditorium and library, room for McKinley relics and other rooms which may be used educationally. Connecting the wings of the building, in either of which are the auditorium and library, is the court of honor, built for the McKinley statue, carved from a solid block of marble weighing 35 tons. J. Massey Rhind was the sculptor. The court is surrounded by peristyle of Greek doric columns. The aisle formed by the peristyle contains the busts of many statesmen and business leaders associated with the late President. The court is laid out as an Italian garden.

MEMORIAL BUILDING DEDICATED TO WILLIAM McKINLEY, OCT. 5, AT NILES, O.

Iron and Steel Financial News

Up-to-the-Minute Fact and Comment Collected and Sifted for Busy Readers

Government War Needs Sway Finance

IN one respect, the public's state of mind at present resembles that existing in the autumn of 1914. At that time a tremendous volume of European war buying was impending and trade activity in the United States was about to be stimulated to a rate wholly unprecedented in American business annals. Now, with the United States government committed to a program of war preparation, it is difficult for any one to realize how extensive government buying may become. A few months ago it was estimated the steel requirements for war work would amount to an extremely small percentage of steel producing capacity. More recently it was estimated that the government would specify about 7,000,000 tons in the next few months, presumably for 1918 delivery. This tonnage would amount to nearly 20 per cent of annual production. But it is difficult to estimate what the government's requirements may be before the close of 1918. Just now the war program is in the preliminary stages. Machinery is being purchased for many large plants to make ordnance. Several immense shipyards have just been authorized and some months hence will take much ship steel. The output of all ship equipment, from engines to anchors, is being expanded enormously, to keep pace with the program for constructing hulls. Some contracts for shells have been placed, but these are inconsequential in contrast with what will be required when the ordnance to fire these shells is turned out in requisite measure.

Stimulates Production

An idea of the proportions which government buying may reach is gained from the situation in the copper industry. As in the case of steel, the war industries board fixed a price by agreement with producers. It requested producers to sell no more metal until its own requirements were taken care of. Last week it was reported unofficially that the government had stimulated the requirements of itself and the allies at 120,000,000 pounds monthly over the last three months of 1917. The output of American refineries in September was down to about 130,000,000 pounds, due to labor troubles at mines and smelters in July and August. This output undoubtedly will be increased in October and later, but it seems inevitable that there will be a scarcity of metal for ordinary consumers. The exports of copper this year have averaged about 86,000,000 pounds monthly and on the basis of the reported requirements the government would be taking about 34,000,000 pounds for its own use. This amount is far in excess of what had been expected in the trade.

Signs Deficiency Bill

Last Saturday the President signed the urgent deficiency bill, carrying $7,758,124,000 for war purposes, the largest appropriation measure in the history of the United States. Now that this step has been taken the way has been made clear for considerable government activity, including the construction of additional capacity for building torpedo boat destroyers. It is expected that one New England yard alone will expend $12,000,000 on a new plant for this work, while other shipbuilders will add to their capacity for destroyer construction. The bill also appropriates immense sums for ordnance, shells and other munitions.

Steel stocks generally showed net declines last week, possibly because of the radical levies to be made by the government through the new war revenue law. But the feature of the week's market was the sensational decline in the standard, dividend-paying, railroad shares. New York Central declined to 73⅛, compared with 103⅝ earlier this year, touching the lowest level since the Civil war. St. Paul reached the lowest price since 1877. Baltimore & Ohio sold at the lowest price in 17 years. Several explanations were offered for this decline, but the one most widely accepted was that the demand by the government for liquid capital now evidenced in the new $3,000,000,000 bond flotation, is a factor bound to be felt in all investment securities.

Machine Men Push Loan

Organized for the purpose of stimulating interest in the second Liberty loan, the machinery and machine tool trades committee of the Liberty loan committee has established offices at 334 Fourth avenue, New York, as headquarters for the following officers: Chairman, J. W. Lane, president of the E. W. Bliss Co., Brooklyn, N. Y.; vice chairman, H. R. Swartz; secretary, George J. Low, and publicity manager, Charles A. Hirschberg. J. W. Lane who was made chairman by Governor Strong of the Federal Reserve bank, called together a number of men, prominent in the machine tool trade at New York, to co-operate with him. The committee has requested that manufacturers of machinery and machine tools communicate with the secretary for full information, subscription blanks and other literature.

Subscribe for Bonds

Liberal support is being given to the second Liberty loan by leading iron and steel companies. Early subscriptions which already have been made include: The Republic Iron & Steel Co., $4,000,000 at New York, $800,000 at Youngstown and $1,000,000 at Cleveland; Pickands, Mather & Co., Cleveland, $1,000,000.

Takes Control of Works

The Sanford Riley Stoker Co., Ltd., Worcester, Mass., with a plant in Hyde Park, Mass., has purchased the control of the Murphy Iron Works, Detroit, and will double its capacity. R. Sanford Riley, president of the Worcester company, who also is a director of the Norton companies, has been elected president of the Detroit company. The latter will continue under the same management and title. The two companies make mechanical stokers but do not com-

pete. The Detroit company makes a small stoker for power plants, while the Worcester company makes larger units for industrial and public utilities service.

Algoma Earnings Running at Increased Rate

Earnings of the Algoma Steel Corp., a subsidiary of the Lake Superior Corp., according to a report made by J. Frater Taylor, president of the former company, at a meeting of the stockholders of the Lake Superior Corp., held at Camden, N. J., were shown to be at the rate of $5,000,000 for 1917, as contrasted with earnings of $4,000,000 in 1916. Through the recent acquisition of a blast furnace having a capacity of 400 tons daily and additional open-hearth facilities, the company has brought its basic steel production up to 50,000 tons of ingots monthly. The board of directors is unchanged except for the election of R. Home Smith of the Algoma Central & Southern railroad to that body.

Large Merger of Southern Works Under Way

Birmingham, Ala., Oct. 9.—Plans for merging the interests of the Anniston Steel Co., the Anniston Metallurgical Co., the Southern Munitions Corp. and the Southern Manganese Corp., all at Anniston, Ala., and offshoots of the Alabama Power Co., are being worked out by Theodore Swann, president of the Anniston Steel Co., now in New York. The new company will be known as the Anniston Steel Products Co., it is reported, and in addition to the plants named it will take over the Anniston Ordnance Co. and the properties of the Illinois Car & Equipment Co., and leases of the Southern Car & Foundry Co. at Anniston will be taken up. The merger will be one of the larger corporations of the kind in the south.

Furnace Taken Over

The Carbon Iron & Steel Co., Parryville, Pa., has surrendered its charter and the entire operation, together with all contracts and obligations, has been taken over by the newly organized Carbon Furnace Co., effective Sept. 1. The organization of the new company has not yet been entirely perfected, but M. S. Kemmerer will continue as chairman and also as the dominating interest.

Financial Crop Ends

To provide for expansion, the Macleod Co., Cincinnati, sand blast equipment and metallurgical furnaces, has increased its capital to $100,000, according to a communication received from Walter Macleod, president of the company. The Macleod Co. is entering upon its twenty-first business year.

* * *

The Cleveland Tractor Co., Cleveland, formerly known as the Cleveland Motor Plow Co., is planning to increase its capital stock from $600,000 to $6,000,000—$600,000 of the new stock to be issued immediately. The stock is closely held. The company is adding greatly to the capacity of its plant.

* * *

The New Britain Machine Co., New Britain, Conn., has called a special meeting of its stockholders for Wednesday, Oct. 24, to take action on the recommendation of the board of directors to increase the capital stock from $1,000,000 to $1,500,000. This increase is to cover improvements and enlargements of the plant.

* * *

Articles of incorporation have been filed by the William J. Oliver Plow Co., Knoxville, Tenn., plows and farming implements, which has been organized with $200,000 capital. The new company, organized by Sam C. House. H. F. Armstrong, Asa Hazen, Joseph L. Grant and T. A. Wright, will continue the business of the William J. Oliver Mfg. Co.

* * *

The Lycoming Foundry & Machine Co., Williamsport, Pa., which recently received a large order for automobile motors, has completed negotiations for the purchase of the plant of the United States Machine Co., South Williamsport. The present equipment will be moved from the latter plant and after changes have been made it will be operated by the Lycoming company as a foundry.

Wharf Contracts Let For New Ojibway Plant

The Great Lakes Dredging Co., of Canada, Port Arthur, Ont., has been awarded the contract for the construction of wharves, slips and dredging in connection with the huge steel plant to be erected for the Canadian Steel Corp. at Ojibway, Ont. The Canadian Steel Corp. has acquired about 2500 acres of land at this point, with a frontage of two miles on the Detroit river. The proposed docks to be constructed by the Great Lakes Dredging Co., Ltd., of Canada, will be on this frontage. The slips to be built will be 2100 feet long by 250 feet wide. The Canadian Steel Corp. is asking for tenders for the construction of 150 houses for the accommodation of workmen. All construction work at the plant is to be rushed, as the company desires to turn out shipbuilding plates to help the allied governments. The Great Lakes Dredging Co., Ltd., of Canada, has all the plant necessary for the carrying on of the present development at Ojibway and will commence work at once.

Great Strength

Of Phenol Conspicuous in Market—Government Buys Toluol

New York, Oct. 6.—Remarkable strength in phenol continues the outstanding feature of the coal tar products market. The supply is scarce and the output practically is disposed of to December. Hence consumers are more anxious to buy than producers to sell. Current inquiry involves much material for prompt and nearby and as this is difficult to secure, consumers are shifting to futures. A fair amount of business, mainly for December, was closed and this position is firm now at 45 cents per pound, at producer's plant. Future contracts may be quoted at 43 to 45 cents.

Benzol continues to weaken. Output is overtaking demand. The market now may be quoted at 50 to 54 cents per gallon for spot and 50 to 53 cents for contract. Nothing definite has developed in the expected action of the government to substitute picric acid for trinitrotoluol. Small quantities of spot toluol were sold in the week at $1.75 per gallon. The government placed several fair-sized lots at $1.50 per gallon.

Solvent naphtha has not been in as good demand this week as last week so that there again is a tendency toward weakness. Prices continue from 17 to 20 cents. Sales of sulphate of ammonia this week again were made up of a few spot carloads on which $4.90 to $5.05 per 100 pounds at seaboard was done.

Coke Oven By-Products

Spot

Per Gallon at Producers Plant	
Pure benzol	$0.50 to .54
Toluol	1.70 to 1.80
Solvent naphtha	.17 to .20
Per Pound at Producers Plant	
Phenol	$0.45
Per 100 Pounds at Seaboard	
Sulphate of ammonia	$4.90 to 5.05

Contract

Per Gallon at Producers Plant	
Pure benzol	$0.50 to .53
Toluol	1.50 to 1.80
Solvent naphtha	.17 to .20
Per Pound at Producers Plant	
Phenol (nominal)	$0.43 to .45
Per 100 Pounds at Seaboard	
Sulphate of ammonia	nominal

The National Slag Co., Allentown, Pa., has purchased from the Bethlehem Steel Co. the large deposits of slag at its Lebanon blast furnaces.

Tool Priorities Board Advocated

Quibbling of War and Navy Departments Over Importance of Their Respective Requirements Leads to the Suggestion of a Machinery Priority Board —Philadelphia Attracts Sellers of Shipyard Equipment

PRIORITY of deliveries of machine tools soon may be determined by a single individual or committee vested with authority by the government to exercise this important function. It is known steps are being taken along this line at Washington, because of the many conflicts which have taken place between the requirements of various government departments, each of which has deemed its own needs most important. The war department, for instance, has maintained the tools needed for ordnance to support the army at the front should take precedence over all other work, while the navy department has insisted that machines needed for the destroyer program are of greater importance. Appointment of a machinery priority official or committee would remove this friction and increase the efficiency of government buying.

Government Still Active in Market

The Boston navy yard has issued a list of about 60 large tools, the Rock Island arsenal is asking for a number of machines. The Standard Ordnance Co., 11 Broadway, New York, has issued a list of about 75 machines, including lathes, screw machines, milling machines and planers, for a western ordnance plant. All plate working machinery for the new United States government locomotive shop in France has been bought, the government having confirmed orders placed through the purchasing department of the Pennsylvania railroad. The Lackawanna Bridge Co., 2 Rector street, New York, has issued a list of punching, shearing and hydraulic machinery for the proposed shipyard of the Submarine Boat Co. in Newark Meadows, N. J., and is negotiating for six or seven cranes for this work.

Contract for Many Tools

The General Electric Co., Schenectady, N. Y., has purchased a number of tools, including big lathes and boring machines, for its Erie, Pa., plant and also has closed for equipment for its Philadelphia plant Schewan Tomes & Co., 12 Broadway, are inquiring for a few tools for shipment to China, including a 30-inch boring lathe, radial drill and screw machine. The Newton Machine Tool Works, Philadelphia, has closed for two hammers, one 2000 and the other 1500 pounds. The Union Pacific railroad is inquiring for a 1100, a 1500 and a 3000-pound hammer. A New York dealer has closed an order for lathes, milling machines and planers for export to Japan. The General Vehicle Co., Long Island City, and the Simplex Automobile Co., New Brunswick, N. J., have not yet closed against their large equipment requirements for airplane engine work. Munition makers in New York and New Jersey territory are steady buyers of a few tools at a time.

Crane Demand Undiminished

At present Philadelphia is the center of interest to sellers of shipyard equipment, owing to the activity of the American International Corp., the Merchant Shipbuilding Co., the Chester Shipbuilding Co. and others engaged in the shipyard expansion in this territory. The crane market still is active. The Tacony Ordnance Corp., Philadelphia, has closed for 14 cranes, including four 5-ton, five 10-ton, two 15-ton, one 25-ton and one 30-ton electric traveling cranes, together with one ladle crane. The Penn-Seaboard Steel Corp., Philadelphia, has closed for four cranes to Alfred Box & Co., Philadelphia. The Cayuga Steel Co., Auburn, N. Y., is in the market for a 10-ton electric traveling crane. The Braden Copper Co., 120 Broadway, New York, is inquiring for a 10-ton electric crane for export. The Westinghouse-Church-Kerr Co., New York, is inquiring for a 10-ton traveling crane for Ivanhoe, Va. The Newport News Shipbuilding & Dry Dock Co., which recently was figuring on a 250-ton derrick, now is inquiring for a 250-ton hammerhead crane. The Groton Iron Works, Groton, Conn., is inquiring for three 5-ton electric cranes, of 38, 48 and 58-foot span. The American International Corp., which recently closed for 500 steel derricks and 500 steam hoisting machines for its Hog Island, Pa., yard, has not yet closed for electric or locomotive cranes, of which it is thought some will be needed. Neither has it issued a list of punches, shears or other shipyard equipment. The Federal Shipbuilding Co. has asked for figures on hoists for its new yard in Newark Bay,

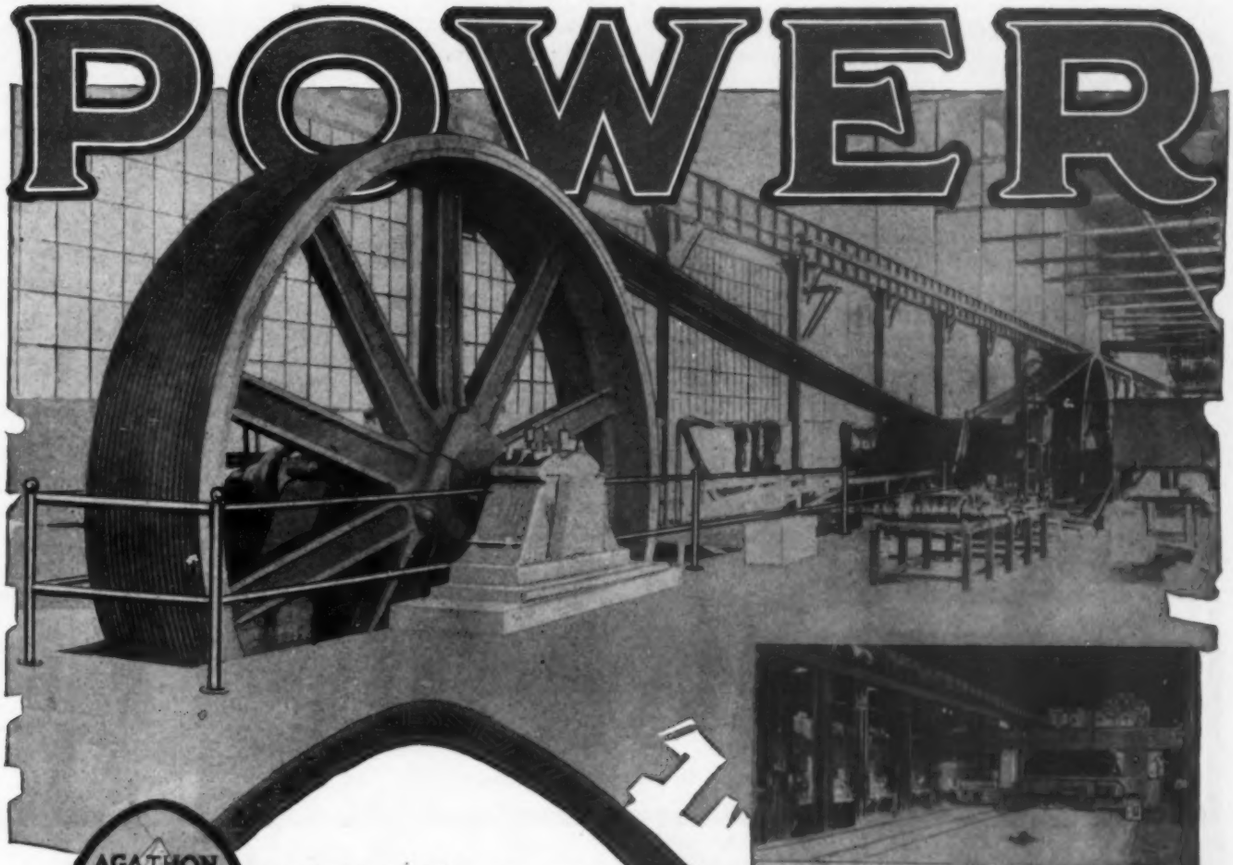
Buying Lags in Chicago

GENERAL buying in small lots constitutes the bulk of the present trade in the Chicago market. No large deals are pending and heavy buying for further war production is being held in abeyance. The placing of orders for "Liberty" motors or parts is expected to develop a demand for tools on the part of those who obtain contracts. Railroads are not in the market, except occasionally, to fill a pressing need. Orders for equipment for the additions to the arsenal at Rock Island are being placed by the Stone & Webster Engineering Corp. and the Westinghouse, Church, Kerr Co. This has the effect of placing the business in the east rather than in Chicago. Second hand machines are being held at a high price by owners and dealers are not buying them to any extent. The Kohler Co., Kohler, Wis., is building an addition. The Romeo Foundry Co., Port Huron, Mich., also is building additions. The Petoskey Pump Co., Petoskey, Mich., is enlarging its plant. Machine shop additions are being built by the McCord Mfg. Co., Detroit, the St. Louis Machine Tool Co., St. Louis, and the Standard Forgings Co., Indiana Harbor, Ind.

Price Fixation Has Little Effect on Market

PRICES named by the government for iron and steel products do not appear to have had any effect one way or the other on the machinery and machine tool market in the Pittsburgh district. Mak-

POWER



AGATHON STEELS

It takes POWER—enormous power to keep the wheels turning in the constant effort to keep pace with the ever increasing demand for AGATHON Alloy Steels and also to keep up AGATHON QUALITY.

We've got the power too, and if Agathon Quality ever does vary IT'S GOING UP—to the goal we're always striving for—Perfection.

Above is shown one of the main drives in our plant, and down the right side some of the machines it helps to operate.

THE CENTRAL STEEL COMPANY
Massillon, Ohio

Detroit Office: 326-27-28 Ford Bldg., F. Walter Guibert, District Representative.
Cleveland Office: Hickox Building, The Hamill-Hickox Company, District Representative.
Chicago Office: Room 1370 People's Gas Building, 120 South Michigan Blvd., A. Schaeffer, District Representative.
Philadelphia Office: 603 Widener Building, Frank Wallace, District Representative.
J. E. Dockendorff & Co., 20 Broad St., New York, N. Y. General Export Agents.

AGATHON
ALLOY STEELS

Say you saw it in THE IRON TRADE REVIEW

ers continue to quote on the same basis as heretofore, but inquiries are extremely limited. The reduction in prices of iron and steel products, it is apparent, could not have any effect on prices for machinery and machine tools for domestic use, inasmuch as deliveries cannot be made for six months or longer and steel has been bought by equipment makers on contracts. What may be done regarding prices for machinery and machine tools purchased by manufacturers engaged on government work remains to be seen. The Cleveland Crane & Engineering Co., Cleveland, has taken a contract from the Donner Steel Co. for the following cranes: One 20-ton, two 15-ton and one 5-ton. These cranes are for installation in the works of the buyer at Buffalo.

Government Asks For Lathes

TRADE in the Cleveland machine tool market has been augmented during the past week by a government inquiry for about 50 lathes. Activities in the southern part of the state also have commanded attention; chiefly through the inquiry of a Dayton (O.) maker of gun sights for 41 milling machines for early delivery, and the reported closing of a contract by the Lincoln Motor Co., Detroit, with a Cincinnati machine tool builder for about 135 milling machines. Dealers report that deliveries on milling machines are being still further delayed and that at the present time it is difficult to secure delivery before Jan. 1. No positive assurance is given that dealers can maintain this schedule owing to the ever-increasing demands made upon the machine tool industry by the government. The Motor Engineering Co., Cleveland, is in the market for a milling machine. Prices on positive pressure blower for a cupola have been requested by the Deshler Foundry & Machine Co., Deshler, O. The Ohio Colleries Co., Ohio building, Toledo, O., is in need of a 6 x 6-inch power hack saw. The H. V. Dockery Brass & Iron Co., Zanesville, O., is asking for prices on a 16 or 18-inch lathe. The Diamond Match Co., Barberton, O., lately has made inquiry for a motor-driven grinding machine.

New Construction and Equipment

Concise and Timely Business Building Opportunities from the Field of Industry

Among New England Factories

BENNINGTON, VT.—The Holden, Leonard Co. will build a 4-story, 150-foot addition to its mill.

DERBY LINE, VT.—The Butterfield Co., a subsidiary of the Union Twist Drill Co., has let the contract for a brick and reinforced concrete, 3-story, 60 x 77-foot factory to cost $60,000.

ATTLEBORO, MASS. — The H. & B. American Machine Co. will build a 3-story, 76 x 100-foot pattern storage building and a 1-story, 100 x 160-foot addition to its 2-story building.

BOSTON.—John Herbert will build a brick and steel, fireproof, 5-story, 60 x 60-foot public garage at 14-16 Custom house street.

FITCHBURG, MASS. — The Fitchburg Steam Engine Co. has let the contract for a brick, 1-story, 30 x 88-foot erecting shop on Cleghorn street.

LOWELL, MASS.—The plant of the Northern Waste Co. was damaged by fire recently to the extent of $100,000.

MANSFIELD, MASS.—The Harding Mfg. Co., maker of tools, is rebuilding its 1-story, 60 x 100-foot plant.

MILLBURY, MASS.—The Millbury Steel Foundry Co. has let the general contract for two 1-story foundry additions to be 64 x 50 feet and 30 x 122 feet.

SPRINGFIELD, MASS.—The Wason Mfg. Co., maker of railway car wheels, has let the contract to remodel its works at a cost of $50,000 for the making of battle planes for the United States army. An addition will be made to the main building and alterations to the interior.

TAUNTON, MASS.—The Taunton Stove Lining Co. will build a 1-story pattern shop, 41 x 70 feet to cost $5000.

WORCESTER, MASS.—The state has let the contracts for a brick, 2-story, 40 x 60-foot power house and other improvements to cost $76,000 at the Grafton state colony, Summer street. Three boilers will be installed.

WORCESTER, MASS.—The David Gessner Co. has been incorporated to make textile machinery with $250,000 capital by David Gessner, Anton Schmid, Walter L. Gunther, William Fick and W. M. Kennard, Montclair, N. J.

EAST GREENWICH, R. I.—Plans are being figured for a 76 x 151-foot and a 52 x 128-foot building for the Gallaudet Aircraft Corp. on Chepiwanoxet Island.

BRIDGEPORT, CONN.—The Luster Products Corp. has been incorporated with $25,000 capital by M. K. Pedersen, G. L. Watt and Clarence R. Hull.

MERIDEN, CONN.—The Summit Thread Co. has let the contract to the Lewis A. Miller Co. for a brick, 3-story, 40 x 100-foot mill addition.

NEW BRITAIN, CONN.—The North & Judd Mfg. Co. has let the contract for a 2-story factory building to cost $40,000 on Stanley street.

NEW HAVEN, CONN.—The Kilborn & Bishop Co., 194 Chapel street, has let the contract for a 1-story forge shop to be 50 x 120 feet.

STAMFORD, CONN.—Ricards & Co. have let the contract for a brick and steel, 1-story, 90 x 181-foot addition to their factory to cost $26,000.

Business Changes Are Announced

The business interests of Frank L. Patterson & Co., and Benjamin F. Kelley & Son, have been combined under the name of the Patterson-Kelley Co. Offices will be maintained at 26 Cortlandt street, New York. The new company will manufacture heaters and act as a heating engineer.

The New York offices of the Platt Iron Works have been removed to Room 705, 160 Broadway.

The Dunham Co., Berea, O., agricultural implements, has removed its general offices to 801-804 Hippodrome building, Cleveland. The factory will not be removed.

The Columbia Steel & Shafting Co., Pittsburgh, has established a branch sales office at 295 Brodway, New York, in charge of Tracy F. Manville.

World Series Talks with

ROLLING MILL JIM

What good would the World Series have done me if I hadn't been running the Mill with HUBBARD ROLLS?

So long—

Rolling Mill Jim.

Hubbard Steel Foundry Co.

EAST CHICAGO, IND.

All Kinds of Iron and Steel Rolls and Steel Castings.

Say you saw it in THE IRON TRADE REVIEW

Along the Middle Atlantic Seaboard

BINGHAMTON, N. Y.—The board of education plans to erect a 2-story addition to Oak street school, to cost $50,000. C. M. Carlton and L. J. Kaley, O'Neill building, are preparing the plans.

BROOKLYN, N. Y.—The bureau of yards and docks at Washington soon will take bids on a power plant for the naval hospital at Brooklyn.

BROOKLYN, N. Y. — The Galvanizing Corp. of America has been chartered with $36,000 capital to make galvanizing machinery. The incorporators are: H. Gerson, W. Stetter and I. Seegmiller, 29 Broadway.

BUFFALO.—The Globe Pattern Shop will build a 1-story pattern shop to cost $3000.

BUFFALO.—The Greater American Chemical Co. has let the general contract for a 2-story plant addition, 30 x 60 feet.

BUFFALO. — The Foster Specialties Co., Eighteenth street, plans to erect a 3-story factory, 60 x 260 feet.

BUFFALO.—The Foster Specialty Co. will build a 3-story plant, 60 x 260 feet. A machine shop and foundry also will be built.

BUFFALO.—The Buffalo Dry Dock Co. will build a 1-story machine shop to be 100 x 100 feet. Butler & Mills have the general contract.

BUFFALO.—The Globe Pattern Shop, 39 Henry street, has awarded Walter W. Gruip, 205 Riley street, a contract to erect a pattern shop, 32 x 90 feet.

BUFFALO.—The Buffalo Dry Dock Co. has awarded Butler & Mills, Endicott Square building, a contract to erect an addition to its machine shop, 100 x 100 feet.

BUFFALO.—The Greater American Chemical Co., Colgate street, has awarded the Peckham Construction Co., Mutual Life building, a contract to erect a 2-story factory, 30 x 60 feet.

LOCKPORT, N. Y. — The United Paper Board Co. has awarded Curran & Swartout, 440 Granite building, Rochester, N. Y., a contract to erect a power house, 35 x 100 feet.

NEW YORK.—The Braden Mfg. Co. has been incorporated with $20,000 capital to make dies and tools by P. Rooney, D. A. Young and R. W. Braden, 135 West Third street.

NEW YORK.—The W. N. Best Smoke Consuming Co. has been chartered with $50,000 capital to make smoke eliminators by E. S. Hammond, A. H. and W. N. Best, 383 Gates avenue, Brooklyn.

NEW YORK.—The Taylor Motors Corp. has been incorporated with $100,000 capital to make motors, and motor vehicles by A. E. Moore, G. F. Jerbett and A. F. McCabe, 19 Tompkins avenue.

NEW YORK.—The Mayo Engineering Co. has been incorporated with $200,000 capital to engage in a business as mechanical and electrical engineer. The incorporators are: J. S. Bernstein, G. F. Kerr and V. J. Mayo, 546 Fourth street, Brooklyn.

NEW YORK. — The Landau Machine & Drill Press Co. has been chartered with $10,000 capital to make automatic multiple spindle drill presses. The incorporators are: N. Fromm, J. J. Mulcahey and J. N. Landau, 115 Broadway.

ROCHESTER, N. Y.—The Bridgeford Machine Tool Co. has awarded Alexander Shumway & Utz, 16 State street, a contract to erect a 2-story machine shop, 120 x 214 feet.

ROCHESTER, N. Y.—The board of education plans to erect the Jefferson junior high school, to cost $500,000. Edwin S. Gordon, 300 Sible block, is preparing the plans.

ROCHESTER, N. Y.—The Calumet & Massey Copper Co., capitalized at $250,000, has been organized to acquire and hold mining land. The incorporators are: G. H. Forschler, F. H. Lewis and W. C. Runne.

ROCHESTER, N. Y.—The Forsyth Automatic Pump Co. has been incorporated with $800,000 capital to make automatic pumps for vending gasoline by G. D. Forsyth, C. W. Gregg and C. W. McKay, 206 Rutger avenue.

UTICA, N. Y.—The Mutual Boxboard Co. has let the general contract for a 1-story boiler house addition to be 22 x 56 feet and cost $5000.

EAST PITTSBURGH, PA.—The Westinghouse Electric & Mfg. Co. is planning to erect a foundry, 165 x 241 feet, to cost $50,000. Prack & Perrine, 803 Keystone Bank building, Pittsburgh, are preparing the plans.

ERIE, PA.—The Modern Tool Co. plans to erect an addition to its factory at Fourth and State streets, to cost $10,000.

ERIE, PA.—The Griffin Mfg. Co., Fifteenth and Cherry streets, plans to erect an addition, 54 x 150 feet, to its hardware factory, to cost $15,000.

HOLLIDAYSBURG, PA.—The government plans to erect a post office, 59 x 72 feet, to cost $80,000. J. A. Wetmore, treasury department, Washington, is preparing the plans.

LIBRARY, PA.—The board of education has awarded Willock & McEwen, Castle Shannon, a contract to erect a 2-story addition to the high school, to cost $20,000. J. Edwards Keirn, 3945 Brighton Road, Pittsburgh, is preparing the plans.

NEW CASTLE, PA.—T. J. Burke plans to build an addition to the Cymric theater, to cost about $25,000.

PHILADELPHIA.—The J. G. Brill Co. will build a 2-story plant addition, 100 x 120 feet to cost $25,000.

PHILADELPHIA.—The Tinius Olson Casting Machine Co. has let a contract to the Lam Building Co. for an addition to its plant.

PHILADELPHIA.—The William Steele & Sons Co. has been granted a permit to erect a manufacturing addition for H. O. Wilbur & Sons, Inc., at Third and New streets.

PHILLIPSBURG, PA. — James F. Stott, has awarded W. A. Hoyt, Hutchinson building, Altoona, a contract to erect a 3-story store and office building, 58 x 130 feet, to cost $40,000.

PHILADELPHIA.—The Stone & Webster Engineering Corp. has taken a contract for the erection of a 400 x 400-foot brick, concrete and steel power station for the Philadelphia Electric Co. at Beach & Palmer streets. The plant, when completed, is to cost between $8,000,000 and $9,000,000.

PITTSBURGH. — The Point Motor Sales Co. has awarded D. T. Riffle, Keenan building, a contract to erect a 3-story commercial garage, 45 x 110 feet at a cost of $50,000.

PITTSBURGH. — Follansbee Bros. Co., Third avenue and Liberty street, has awarded Schultz, Schreiner & Clyde Co., May building, a contract to erect a 2-story addition, 80 x 100 feet, to cost $60,000. R. M. Trimble, 705 Ferguson building, is preparing the plans.

SOUTH BROWNSVILLE, PA. — Luzerne township plans to erect a 2-story high school, 41 x 67 feet, to cost $20,995. John H. Harman, 632 First National Bank building, Uniontown, Pa., is preparing the plans.

VANDERGRIFT, PA.—The board of education has awarded Lawrence & Critchfield, Somerset, Pa., a contract to erect a 2-story high school, to cost $80,000.

WASHINGTON, PA.—C. B. M. Allister has awarded George S. Kendall a contract to erect a garage, to cost $30,000.

BALTIMORE.—The Colle Muffler & Safety Valve Co. will build a 2-story plant addition, to cost $3500.

DUNELLEN, N. J.—The Ransome Concrete Machinery Co. will build an addition to its concrete mixer plant, to cost $10,000.

EAST ORANGE, N. J.—The Metal Shelter Co. has been chartered with $100,000 capital to conduct a manufacturing business by Allan K. Pruden, Louis Brooks and Isaac Josephson.

EAST ORANGE, N. J.—The Federal Adding Machine Co. has been chartered with $10,000,000 to manufacture and deal in adding machines and other devices. The incorporators are: Gordon Grand, Harry H. Picking and Charles O. Geyer.

IRVINGTON, N. J.—The Irvington Insulator & Varnish Works will build a 1-story plant, 100 x 200 feet. Carl Berger is president.

JERSEY CITY, N. J.—Henry Burne, 392 Mercer street, will build a 1-story machine shop, 47 x 95 feet, to cost $8000.

NEWARK, N. J.—The Lackawanna Bridge Co. has taken out permits for four buildings at Port Terminal to cost $35,000.

NEWARK, N. J.—Joseph Oschwald will erect a two-story 65 x 239-foot reinforced concrete service station, at Plane and Hackett streets, to cost about $55,000.

NEWARK, N. J.—The Oxford Truck Co. has been chartered with $125,000 capital to manufacture all kinds of trucks by John J. Bush, Ernest B. Raunser, W. W. Schofield and George W. Nuse.

PATERSON, N. J. — The American Shell Co. has purchased the shell plant of the East Jersey Pipe Works and soon will begin the production of shells for the government.

SHARPTOWN, MD.—The Eastern Shore Shipbuilding Co. will build a shipbuilding plant to cost $150,000. R. R. Livingstone, 2 Rector street, New York, is president.

Small Steel Castings QUICK!

When **EMERGENCIES** arise—when you need small steel castings and need them **QUICK**—that is just the time when we can be of priceless service to you.

In anticipation of emergencies, we hold 30% of our entire capacity open. This enables us to give you your castings right on time. It enables us to give you

"Farrell-Cheek" Service

Quality, too, is the important feature of our products. Farrell-Cheek products are second to none.

What are your requirements?

Small Steel Castings

For

Tractor Work, Machine Tool Work, Truck Work, etc.

Also

Blank Gears, and Carbonizing and Case Hardening Boxes

Farrell-Cheek Steel Foundry Co.

SANDUSKY, OHIO

Branch Offices

New York Philadelphia Chicago

Activities in the Central States

APPLETON, WIS. — Van Heuklom & Schulze have taken the general contract for erecting the new automobile body manufacturing plant of the Appleton Auto Body Co. at Pierce avenue and Spencer street.

HUDSON, WIS. — The Wm. Baumeister Co., St. Paul, Minn., has been awarded the general contract for the erection of the new $75,000 high school. Parkingson & Dockendorff, LaCrosse, Wis., designed the building.

KOHLER, WIS.—Brust & Philipp, architects, 506 Free Press building, Milwaukee, are preparing plans for a 3-story fireproof factory and shop addition, 78 x 212 feet, for the Kohler Co., Kohler, Wis. Bids will be taken early in October. The cost of the project will be about $150,000.

MILWAUKEE.—Herman J. Esser, architect, has awarded the contract for structural steel to the Worden-Allen Co. and the mason and concrete work to Paul Riesen & Sons, both of Milwaukee, on the $100,000 factory addition of the Nunn & Bush Shoe Co. at Fifth and Hadley streets.

MILWAUKEE.—Herbert P. Beers, architect, Chicago, is preparing plans for a $35,000 express office, depot and warehouse for Wells Fargo & Co. at the Union depot, Milwaukee. It will be 50 x 150 feet, two stories and basement, and of reinforced concrete and brick. E. E. Westfall is local superintendent.

MILWAUKEE.—The Weyenberg Shoe Co., Reservoir avenue and Harmon street, has awarded the following contracts on a $150,000 factory addition, six stories and basement, 75 x 275 feet; Mason and concrete work, Paul Riesen & Sons; structural steel and iron, C. Hennecke Co. H. J. Esser, Camp building, is the architect.

OSHKOSH, WIS. — The Diamond Match Co. awarded the contract for constructing a new pumping station for its new $250,000 plant in Oshkosh, to Walter W. Oeflein, 86 Michigan street, Milwaukee.

AKRON, O.—The Portage Wire Co. has commenced construction work on a $12,000 addition to its plant.

CANTON, O.—W. T. Beardsley announces ground will be broken in the latter part of the week for the first of a series of structures to be erected by the Canton Rim Co. of which he is president. The first building will be 60 x 240 feet.

CLEVELAND.—Plans have been filed by Corrigan McKinney & Co., at the city building office for a $11,600 service building.

CLEVELAND.—The Arth Brass & Aluminum Castings Co. has been granted permission to build an 18 x 20-foot foundry addition.

CLEVELAND.—The Grant Motor Car Corp. has been granted a permit to erect a 24 x 40-foot boiler house.

CLEVELAND.—The Silvernail Welding Co. has taken out a permit to build a 1-story, 37 x 60-foot, structure to cost about $3500.

CLEVELAND.—The Clay Engine Mfg. Co. has been chartered with $56,000 capital by Jerome N. Halls and others.

CLEVELAND.—The Bar Oil & Paint Co. has purchased two acres on London road adjoining the Nickel Plate tracks on which it plans to erect a $20,000 factory.

CLEVELAND.—Architect A. J. Watterson, 316 E. Ohio Gas building, has filed plans with the building inspector for a brick garage for the Standard Oil Co. The garage will be 58 x 120 feet and is estimated to cost $20,000.

LOUISVILLE, KY.—The Central Iron & Metal Co. has been incorporated with $5000 capital to manufacture metal specialties by Benjamin B. Kort and others.

CHARLESTON, W. VA.—The Wyatt Coal Sales Co. has been incorporated with a capital stock of $100,000 by T. J. Robson, O. H. Hisperman, J. O. Jenkins, W. L. Brown and J. F. Shaffer.

Western and Intermountain Territory

MINNEAPOLIS.—The Minneapolis Steel & Machinery Co., Twenty-ninth street and Minnehaha avenue, will build additions costing $15,000.

MINNEAPOLIS.—The Toro Motor Co., J. K. Clapper, president, 2728 S. E. University avenue, will build a machine shop 75 x 191 feet. The Tolz Engineering Co., St. Paul, is the engineer.

GALENA, MO.—Plans are being made for the construction of a waterworks plant to cost $100,000.

KANSAS CITY, MO.—The Metzner Stove Repair Co. has been incorporated with $80,000 capital by P. H. Wagner and Melford Loeb.

KANSAS CITY, MO.—The Metzner Stove Repair Co. has been incorporated with $80,000 by Milford Loeb, A. S. Nachman, and P. H. Wagner to manufacture stoves.

KANSAS CITY, MO. — The Kansas City Sheet Steel & Tube Co. has been incorporated with $1,000,000 capital by W. S. Randall, Portland, Me., F. A. Armstrong, Wilmington, Del., and C. G. Egner, Elkton, Md.

MIAMI, MO. — Bonds for $150,000 have been voted for waterworks and electric lights improvements.

DALLAS, TEX.—The Loomis Wheel & Body Works Co. has been incorporated with $7500 capital by A. M. Loomis, E. M. Powell and Walter G. Miller.

EL PASO, TEX.—The Becker-McDougall Hardware Co. has let the contract for an $18,000 building.

TEXARKANA, ARK.—G. M. Stone, Quincy, Ill., is interested in a company recently organized with $100,000 capital for the production of farm tractors, farm machinery and tractors.

GREAT FALLS, MONT.—Cascade County commissioners are planning two bridges over Missouri river to cost $185,000 and $248,000. G. R. Metlen is state bridge engineer.

CENTER, NEBR.—Knox county will take bids until Oct. 20 for rebuilding a 180-foot steel bridge over Verdigris river. G. E. Johnson, Lincoln, is state bridge engineer.

NORTH PLATTE, NEBR.—Lincoln county will receive bids until Oct. 20 for a 600-foot reinforced concrete bridge over Platte river. G. E. Johnson, Lincoln, is state bridge engineer.

OMAHA, NEBR.—The Merrill-Higgins Co. has beeen incorporated with $100,000 capital to manufacture stoves, furnaces and heavy hardware by C. J. Miller, H. B. Merrill and E. A. Higgins.

COEUR D'ALENE, IDAHO.—Fire recently damaged the compressor building of the Ray Jefferson mine on Beaver Creek. Repairs will be made immediately.

HAYDEN LAKE, IDAHO. — The Commonwealth Mining Co. plans the construction of a concentrating plant. The first unit will have a capacity of 60 tons. An 80-horsepower boiler and four compressor drills will be included in the equipment.

The Pacific Coast States

BREMERTON, WASH.—The A. W. Quist Co., Hoge building, Seattle, general contractor for the 9-story reinforced concrete storehouse for the government at the Puget Sound navy yard, has awarded a contract for the reinforcing steel to the Cambria Steel Co. at about $100,000.

SEATTLE.—The Mine Machinery Mfg. Co. has been incorporated with $100,000 capital by J. W. Cover and J. R. McKeand.

SEATTLE.—The Automatic Nut Lock Co. has been incorporated with $100,000 capital by Frank E. Gilbert, Samuel S. Hoover and Charles J. Perret.

SEATTLE.—Gray & Barash, electrical engineers and contractors, have secured permits to erect a $4000 warehouse and a $15,000 machine shop.

SPOKANE, WASH.—Grant Smith & Co., local contractors, have the contract for the construction of the Pine Creek branch of the Oregon-Washington, Railroad & Navigation Co. The line will be ten miles long and cost about $400,000.

The Book You Need On Your Desk

The Rolling Mill Industry

By F. H. KINDL

IN this work the author has endeavored to give a condensed general description of iron and steel rolling mills and their products, without discussing the details of rolling any special material. Essentially it is a summary of American rolling mill practice, its development being traced from the beginning to the present day.

An effort has been made to define more closely the various mills and their products, and the various classifications herein presented have been approved by leading manufacturers and many of the country's foremost iron and steel engineers.

The charts which graphically show the production of semi-finished and finished products, from 2,000 pounds of iron ore, 1,000 pounds of coke and 600 pounds of limestone, represent modern practice at some of the largest open-hearth plants and rolling mills. Charts also are included to clearly illustrate the amounts of material charged and produced in making one ton of pig iron; the distribution and production of iron and steel in 1907 and 1911; the conversion of pig iron into the various finished products, etc.

For those interested in the economics of the iron industry, a table has been prepared in which a comparison has been made of the general fundamental factors dictating the production of pig iron in the United States, Germany and Great Britain, with particular reference to the Pittsburgh district of the United States, the Rheinland-Westfalia district of Germany, and the Cleveland district of Great Britain.

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PENTON'S BOOK NEWS, Cleveland, Ohio

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Say you saw it in THE IRON TRADE REVIEW

New Trade Publications

AIR COMPRESSORS.—Two bulletins, describing and illustrating angle-compound power-driven air compressors and tandem compound corliss air compressors are being distributed by the Sullivan Machinery Co., Chicago. The descriptions of these air compressors are presented in considerable detail and embrace each individual part. Specification tables are given for the consumer's convenience.

PNEUMATIC TOOLS.—The Keller Pneumatic Tool Co., Fond du Lac, Wis., recently issued a catalog containing leaflets on chipping hammers, riveting hammers and sand rammers. Provision is made for incorporating subsequent issues in the same binder. Details of construction, sizes and parts for replacement are described clearly and specifications are designed to furnish buyers with complete information of every tool.

MOTOR TRUCKS.—Two 8-page bulletins devoted respectively to 2¼ and 3½-ton motor trucks are being distributed by the Sanford Motor Truck Co., Syracuse, N. Y. These booklets are unusually complete, giving not only the general specifications such as capacity, speed, etc., but also descriptions of every individual part of the entire chassis and motor. Trucks of 2½-ton capacity are said to attain a speed of 15 miles per hour.

BELTING.—An 8-page bulletin describing belts is being distributed by the Stanley Belting Corp., Chicago. This belting is of the solid woven cotton type impregnated with a special compound. It is claimed that this belting will not stretch more than 2 per cent under normal conditions which amount is taken out during the first 36 hours of service. The booklet also includes specification and price tables as well as a section of instructions showing how to care for the belts.

PACKINGS.—A comprehensive booklet, 54 pages in length, devoted to packing is being distributed by the Mechanical Rubber Co., Cleveland. Packing manufactured by this company is made of long fiber asbestos and other resisting materials combined with a rubber cushion. It is claimed that it is unaffected by dry or moist heat, hot acids, alkalies, oils, or other substances. Over 30 kinds of packing designed for a wide variety of uses are described in the bulletin.

DIE CAST BRONZE.—A folder was recently issued by the McGill Metal Co., Valparaiso, Ind., describing a die cast aluminum bronze. The metal is said to be used quite extensively in the automobile industry owing to its strength. Several of the physical properties are presented, including its tensile and compressive strength, elongation, elastic limit, and hardness. The metal is yellow in color and is said to be malleable, ductile, noncorrosive and to resist the action of both sulphuric and hydrochloric acids.

AUTOMATIC BRAKES.—A 30-page bulletin is being distributed by the General Electric Co., Schenectady, N. Y., describing in detail automatic solenoid brakes for direct or alternating current motors. Units can be made in various sizes and can be bolted to the floor or attached to the motor frame. The brakes are said to be applicable to draw, lift, ore or coal bridges, turntables, shafting, elevators, etc. The automatic solenoid brakes are said to be so designed that adjustment for shoe wear is required for only two purposes; to maintain a constant value of air gap in the solenoid and to divide and maintain an equal clearance between the wheel and each of the two shoes. The wearing surface on the shoes is an asbestos compound. The booklet is well illustrated and many diagrammatic views of the brake are presented in order to facilitate ordering.

CONTINUOUS KILNS.—A handsomely illustrated 40-page booklet, published by the American Clay Machinery Co., Bucyrus, O., shows the progressive steps entailed in the building of a large continuous kiln for the Lincoln Paving & Block Co., Corning, O. This kiln contains 36 chambers and has a total length of 451 feet. Each chamber has a capacity of 1000 paving blocks. Construction was started Oct. 20, 1914, and the kiln was practically ready for operation March 11, 1915.

BENCH LEGS.—An 8-page booklet has recently been issued by the New Britain Machine Co., New Britain, Conn., describing a new type of bench support. These bench supports are said to be a reproduction of the cast iron bench leg previously manufactured by the company, with the exception that the new type of leg is built entirely of formed sections electrically welded, no rivets being used in its construction. The particular advantage claimed for this type of bench leg is its stiff construction without any dependence upon the wall which enables it to support the shelf and bin construction, to allow heating pipes in the rear, and to permit a change of bench location without loss or damage.

HARDNESS TESTING.—A 12-page bulletin devoted to Brinell hardness testing machines has been published by the Scientific Materials Co., Pittsburgh. The Brinell methods of hardness testing consists in pressing a hardened steel sphere, which will not undergo deformation, into the surface of the metal to be tested, and measuring the diameter or preferably the depth of the indentation. The machine employed for the test is a hydraulic press, the heavy base of which contains hydraulic power generation and transmission. The upper neck is cast with the base, and carries the hydraulic piston. The standard hardened steel ball, 10 millimeters in diameter, is mounted on the end of the hydraulic piston.

ELECTRIC HOISTS. — Four attractive booklets devoted respectively to electric hoists, rope tramway systems, casings for chain drives and a sand and gravel washery were recently issued by the Link-Belt Co., Chicago. The booklet dealing with electric hoists is unusually complete, 34 pages being devoted to this product. The controller is of the drum type and provides for speed regulation. It is fitted with a spring which automatically turns the controller to neutral when the operating cord is released. The fingers are mounted on an impregnated hard maple finger board and are said to be protected from any arc by asbestos barriers. About half of the booklet is devoted exclusively to illustrations.

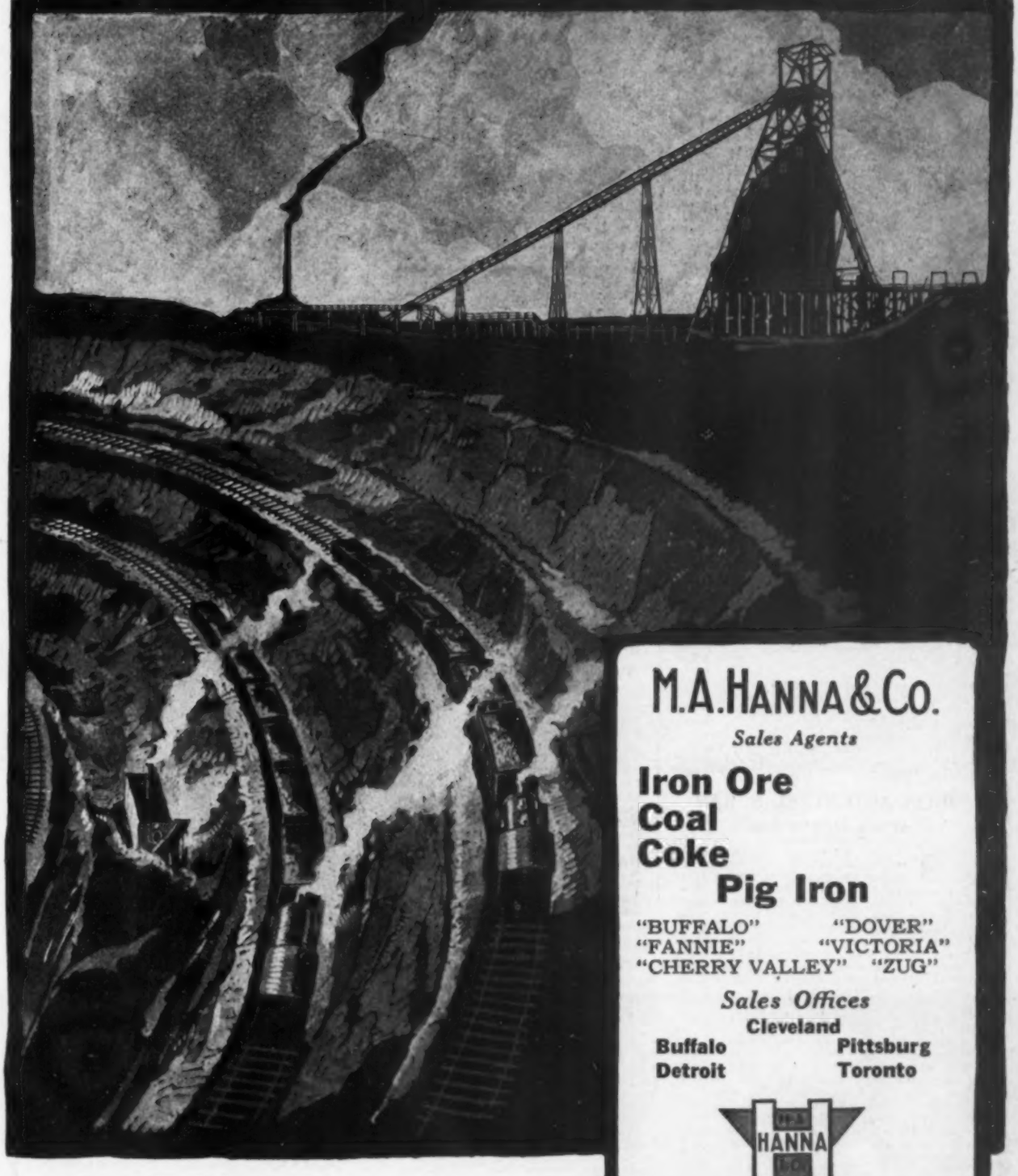
The booklet dealing with rope tramway systems describes a unit which is claimed to embody all of the good features of the man trolley coupled with its own advantages. It is said to eliminate the heavy carriage and to make possible easier and more certain control. Casings for chain drives, in order to provide a more adequate system of lubrication, are recommended in the third bulletin. The fourth booklet describes the installation of a sand and gravel washery at the plant of the Raritan Ridge Clay Co., Metuchen, N. J.

PLATE MILLS.—An exceedingly interesting 40-page booklet was recently published by the United Engineering & Foundry Co., Pittsburgh, describing modern plate mills. In a foreword the company states that the booklet is the result of a great number of questions submitted by prospective buyers of mills. The booklet describes both plain and universal methods of rolling, and shows the performance of 2-high continuous, 2-high reversing and 3-high plain and universal mills. The booklet also presents a brief description of the enormous plate mill which the company is at the present time constructing for the Lukens Steel Co., Coatesville, Pa. The booklet also gives an idea of the producing capacity of mills, heating and power requirements, arrangements of plants and many other necessary details. Several pages are devoted to the treatment of rolls.

FOUNDRY EQUIPMENT. — The Whiting Foundry Equipment Co. is distributing three new bulletins devoted respectively to brass foundry equipment, converters and cupolas. In describing brass foundry equipment the company has reproduced photographs of installations and diagrams designed to give the reader a more comprehensive insight into the fundamentals. The bulletin describes the brass furnace together with its accessories such as tongs, shanks, etc., in detail. This description is supplemented by specification tables which present lists of sizes of crucibles and floor grates. A portion of the booklet is devoted to brass tumbling barrels. In the bulletin describing side blow converters, the complete process of making steel is outlined. In conjunction with this description, the Whiting company has tabulated a complete list of equipment necessary in the operation of a converter foundry.

SAND-BLAST EQUIPMENT. — The extensive line of sand-blast machines built by the Hoevel Mfg. Co., New York City, is illustrated and described in a recently issued 20-page catalog. Among the simpler machines built by this company are included a hose sand-blast and a machine with a stationary nozzle. Different types of revolving barrel machines are illustrated as well as several styles of rotary table sand-blast machines. A sand-blast machine adapted to the cleaning of long and flat pieces such as radiator loops, pipes, columns, plates, etc., also is shown. It is provided with two tables which operate in opposite directions. In addition to a sand-blast cabinet, a large sand-blast room is shown as well as a large capacity room which is equipped with a track and turntable for handling trucks containing castings to be cleaned. A sand-blast room provided with a rotary floor also is illustrated and described. This rotary floor greatly facilitates the cleaning of castings and materially increases the capacity of the room. Numerous service views are included, one showing two rooms with rotary floors, one room with a track and turntable and the other illustrates Hoevel sand-blast equipment in a foundry, consisting of a sand-blast room, rotary table machine and a revolving barrel machine.

HANNA



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Say you saw it in THE IRON TRADE REVIEW

Iron and Steel Prices

Corrected to Tuesday Noon

IRON ORE

Superior Ores, Per Ton, Lower Lake Ports.

Old range Bessemer, 55 iron	5.95
Mesabi Bessemer, 55 iron	5.70
Old range non-Bess., 51½ iron	5.20
Mesabi non-Bess., 51½ iron	5.05

Port Henry Ores, non-Bessemer, Per Unit, Delivered Eastern Pennsylvania.

Old Bed, crude 55 iron	10.50c to 11.00c
Old Bed., concent., 65 iron	11.00c to 11.50c
Harmony, concent., 63 iron	11.50c to 11.75c
Lump (at mines)	$5.75

WAREHOUSE PRICES

Steel bars, Chicago	4.50c
Steel bars, Cleveland	4.50c to 5.00c
Steel bars, Detroit	4.50c
Steel bars, Philadelphia	5.00c to 5.50c
Steel bars, New York	4.75c to 5.00c
Steel bars, St. Louis	4.55c
Steel bars, Cincinnati	4.75c
Steel bars, St. Paul	4.60c
Steel bars, Buffalo	4.60c to 5.10c
Iron bars, Chicago	4.50c
Iron bars, Cleveland	4.45c to 4.95c
Iron bars, Detroit	4.50c
Iron bars, St. Louis	4.45c
Iron bars, Cincinnati	4.75c
Iron bars, Philadelphia	5.00c to 5.20c
Iron bars, New York	5.00c
Shapes, Chicago	5.00c
Shapes, Detroit	5.00c
Shapes, St. Louis	5.05c
Shapes, St. Paul	5.10c
Shapes, New York	5.00c to 5.25c
Shapes, Cleveland	5.00c to 5.25c
Shapes, Philadelphia	5.00c to 5.50c
Shapes, Buffalo	5.10c to 5.35c
Shapes, Cincinnati	5.15c
Plates, Chicago	7.00c to 10.00c
Plates, Detroit	**9.00c to 10.00c**
Plates, St. Louis	7.05c
Plates, St. Paul	**7.10c**
Plates, New York	8.00c to 10.00c
Plates, Cleveland	9.00c to 10.00c
Plates, Philadelphia	10.00c
Plates, Cincinnati	10.00c
No. 10 blue anl. sheets, Chi.	9.50c to 10.00c
No. 10 blue anl. sheets, Cleve.	8.50c
No. 10 blue anl., Buffalo	11.00c to 11.75c
No. 10 blue anl., sheets, St. L.	10.05c
No. 10 blue anl. sheets, Cinci.	10.00c
No. 10 blue anl. sheets, St. Paul	9.60c
No. 10 blue anl. sh., Detroit	9.50c
No. 28 black sheets, Chgo.	9.50c to 10.00c
No. 28 black sheets, Cleve.	8.50c
No. 28 black sheets, Cincin.	8.65c
No. 28 black, Detroit	**9.50c**
No. 28 black sheets, St. L.	9.25c
No. 28 black sheets, St. Paul	9.60c
No. 28 galv. sheets, Chgo.	11.00c to 11.50c
No. 28 galv. sheets, Cleve.	10.00c
No. 28 galv. sheets, Cincin.	10.65c
No. 28 galvanized, Detroit	11.00c
No. 28 galv. sheets, St. L.	11.05c
Hoops, Cleveland	6.00c
Hoops, Detroit	**7.00c**

IRON AND STEEL SCRAP

STEEL WORKS USE

(Gross Tons)

Bundled sheets, Pittsburgh	$24.00 to 25.00
Bundled sheets, Cleveland	23.00 to 23.50
Bundled sheets, Buffalo	20.00 to 21.00
City wrought, short, N. Y.	25.00
Frogs, switches, guards, St. L.	28.00 to 30.00
Heavy melting steel, Pitts.	32.00 to 34.00
Heavy melting steel, Buffalo	30.00 to 31.50
Heavy melting steel, Chgo.	27.00 to 28.00
Heavy melt'g steel, Cleveland	26.75 to 27.50
Heavy melting steel, Cinci.	26.00 to 26.50
Heavy melting steel, east. Pa.	25.00 to 27.00
Heavy melting steel, N. Y.	25.00
Heavy melting steel, St. L.	29.00 to 30.00
Heavy melting steel, Birming.	20.00 to 21.00
Hydraulic pressed sh't, Cleve.	25.00 to 25.50
Hydraulic press. sheets, Pitts.	30.00 to 31.00
Hydraulic pressed sh'ts, Chgo.	23.00 to 24.00
Low phos. steel, Buffalo	41.00 to 42.00
Low phos. steel, Pittsburgh	48.00 to 49.00
Low phos. steel, eastern Pa.	37.00 to 40.00
Shoveling steel, Chicago	25.00 to 26.00
Shoveling steel, St. Louis	26.00 to 27.00
Steel rails, short, Chicago	34.00 to 35.00
Steel rails, short, Cleveland	31.00 to 31.50
Steel rails, short, St. Louis	34.00 to 36.00
Steel rails, old, Birmingham	24.00 to 25.00
Stove plate, Cincinnati	16.00 to 16.50
Stove plate, St. Louis	12.00 to 12.00
Stove plate, N. J. points	18.50 to 19.00
Stove plate, Birmingham	17.00 to 18.00
Stove plate, Buffalo	20.00 to 21.00
Stove plate, eastern Pa.	21.00 to 22.00
Stove plate, Pittsburgh	24.00 to 24.50

(Net Tons)

Boiler plate, cut, No. 1, Chgo.	$17.00 to 18.00
Boiler plate, cut, No. 1, St. L.	15.00 to 16.00
Bundled sheets, Cincinnati	16.50 to 17.00
Knuckles, coup., Chicago	33.00 to 34.00
Knuckles, coup., St. Louis	34.00 to 36.00
Springs, Chicago	36.00 to 37.00
Stove plate, Chicago	16.75 to 17.75
Stove plate, Cleveland	19.00 to 19.50

Freight Rates, Pig Iron

Mahoning and Shenango valleys to:	
Cleveland	$0.95
Newark, N. J.	3.50
Boston	3.70
Philadelphia	3.30
Pittsburgh	.95
St. Louis	3.18
Minneapolis, St. Paul	4.54
Buffalo to:	
Albany, N. Y.	$1.26
New England (rail)	3.10
New York and Brooklyn (rail)	3.10
Virginia furnaces to:	
Boston docks (r. and w.)	$3.05
New England (all rail)	3.25
New York dock (r. and w.)	2.88
Birmingham, Ala., to:	
Cincinnati	$2.90
Chicago	4.00
Cleveland	4.00
Louisville, Ky.	2.65
Minneapolis, St. Paul	5.85
New York (r. and w.)	4.25
Philadelphia (r. and w.)	4.00
Pittsburgh	4.90
Savannah, Ga.	2.75
St. Louis	3.40
Chicago to:	
Des Moines	$2.80
Milwaukee	.50
Minneapolis, St. Paul	2.00
Moline, Ill.	1.40
Omaha	3.58
St. Louis	1.58
Ironton and Jackson, O., to:	
Chicago	$2.54
Cincinnati	1.26
Cleveland	1.62
Detroit	1.81
Indianapolis	1.58
Minneapolis, St. Paul	4.54
Duluth, Minn., to:	
Minneapolis-St. Paul	$1.25
Mayville, Wis., to:	
Minneapolis-St. Paul	$1.75

Freight Rates, Finished Material

Pittsburgh, carloads, per 100 lbs., to:	
New York	19.5 cents
Philadelphia	18.5 cents
Boston	21.5 cents
Buffalo	11.6 cents
Baltimore	18.0 cents
Cleveland	10.5 cents
Cincinnati	15.8 cents
Chicago	18.9 cents
Detroit	15.7 cents
Minneapolis and St. Paul	32.9 cents
Denver	76.1 cents
St. Louis	23.6 cents
New Orleans	30 cents
Birmingham	45 cents
Pacific coast (all rail)	73.9 cents
Pacific coast (tin plate)	70 cents
Pacific coast, via Panama	61.0 cents

IRON MILL USE

(Gross Tons)

Busheling, No. 1, Buffalo	26.00 to 27.00
Busheling, No. 2, Buffalo	17.00 to 18.00
Busheling, No. 1, Pittsburgh	24.00 to 26.00
Cast borings, New York	17.50 to 18.00
Cast borings, eastern Pa.	20.00 to 21.00
Cast borings, Buffalo	19.00 to 20.00
Cast borings, Pittsburgh	20.00 to 20.50
City wrought, long, N. Y.	31.00 to 32.00
Forge flashings, small, Cleve.	23.50 to 24.00
Forge flashings, large, Cleve.	22.00 to 23.00
Forge No. 1 Eastern Pa.	21.00 to 22.00
Grate bars, Buffalo	20.00 to 21.00
Grate bars, N. J. points	18.50 to 19.00
Iron axles, Pittsburgh	**50.00 to 52.00**
Iron axles, Cincinnati	42.50 to 43.00
Iron axles, eastern Pa.	**50.00 to 55.00**
Iron axles, Buffalo	45.00
Iron rails, Chicago	39.00 to 41.00
Iron rails, Buffalo	40.00 to 41.00
Iron rails, Cincinnati	32.50 to 33.00
Iron rails, St. Louis	36.00 to 38.00
Iron rails, Cleveland	40.00 to 40.50
Machine turnings, Buffalo	$17.00 to 18.00
Machine shop turnings, N. Y.	17.50 to 18.00
Mach. shop turnings, Pitts.	18.00 to 18.50
Mch. shop turnings, east. Pa.	18.00 to 19.00
Machine turnings, Birming.	11.00 to 12.00
R. R. mch. cast, No. 1, Buff.	30.00 to 31.00
R. R. wrought, 1, Buffalo	40.00 to 41.00
R. R. wrgt., No. 1, east. Pa.	43.00 to 47.00
R. R. wrought, No. 1, Pitts.	42.00 to 43.00
R. R. wrought, 1, B'ham	25.00 to 26.00
Wrought pipe, Buffalo	26.00 to 27.00
Wrought pipe, eastern Pa.	30.00 to 31.00
Wrought pipe, New York	25.00 to 26.00

(Net Tons)

Angle bars, iron, Chicago	$38.00 to 40.00
Angle bars, steel, St. Louis	26.00 to 27.00
Arch bars & transoms, St. L.	36.00 to 38.00
Arch bars & transoms, Chgo.	39.00 to 40.00
Busheling, No. 1, Chicago	23.00 to 24.00
Busheling, No. 1, Cincinnati	21.00 to 21.50
Busheling, No. 1, Cleveland	24.00 to 25.00
Busheling, No. 1, St. Louis	20.00 to 21.00
Busheling No. 2 Chicago	16.75 to 17.75
Cast borings, Cincinnati	13.00 to 13.50
Cast borings, Cleveland	16.50 to 17.00
Cast borings, St. Louis	13.00 to 15.00
Cast borings, Chicago	15.50 to 16.00
Cut forge, Chicago	29.00 to 30.00
Grate bars, Cleveland	19.25 to 19.50
Iron axles, St. Louis	40.00 to 41.00
Iron axles, Chicago	43.00 to 44.00
Iron axles, Cleveland	44.00 to 45.00
Machine shop turnings, Chgo.	16.25 to 16.75
Mach. shop turnings, Cleve.	16.00 to 16.50
Machine shop turn'gs, Cinci.	13.00 to 13.50
Mach. shop turnings, St. L.	15.00 to 17.00
Pipes and flues, Cleveland	21.50 to 22.50
Pipes and flues, Chicago	21.00 to 22.00
Pipes and flues, St. Louis	17.00 to 18.00
Railroad wrought, 1, Cleve.	34.00 to 35.00
Railroad wrgt., No. 1, Chgo.	32.00 to 33.00
Railroad wrought, 1, Cinci.	30.00 to 30.50
Railroad wrought, 1, St. L.	32.00 to 34.00
Railroad wrgt., No. 2, Chgo.	30.00 to 31.00
Railroad wrought, 2, St. L.	30.00 to 32.00

IRON OR STEEL WORKS USE

(Gross Tons)

Axle turnings, Cleveland	$23.00 to 24.00
Axle turnings, Buffalo	26.00 to 27.00
Shafting, New York	36.00
Shafting, eastern Pa.	45.00 to 47.00
Steel car axles, Birmingham	32.00 to 33.00
Steel car axles, New York	47.00 to 48.00
Steel car axles, Buffalo	45.00
Steel car axles, Cleveland	47.00 to 48.00
Steel car axles, Pittsburgh	50.00 to 52.00
Steel car axles, eastern Pa.	50.00 to 55.00

(Net Tons)

Shafting, St. Louis	35.00 to 37.00
Steel car axles, St. Louis	40.00 to 42.00
Steel car axles, Chicago	41.00 to 42.00

IRON FOUNDRY USE

(Gross Tons)

Car wheels, (iron), Pitts.	$34.00 to 35.00
Car wheels, (steel), Pitts.	43.00 to 45.00
Car wheels, eastern Pa.	31.00 to 33.00
Car wheels, Buffalo	32.00 to 33.00
Car wheels, New York	
Car wheels, St. Louis	30.00 to 32.00
Car wheels, Birmingham	23.00 to 24.00
Car wheels, Cleveland	26.00 to 26.50
Tram car wheels, Birming.	20.00 to 21.00
Cast, No. 1, Birmingham	22.50 to 23.50
Cast, 1, machy., N. J. points	32.00 to 33.00
Cast, 1, heavy, N. J. points	30.00
Cast, No. 1, eastern Pa.	30.00 to 32.00
Cast, No. 1, Pittsburgh	28.00 to 29.00
Malleable railroad, Cincinnati	21.00 to 21.50
Malleable railroad, Cleveland	27.00 to 27.50
Malleable railroad, Buffalo	30.00 to 31.00
Malleable railroad, Pittsburgh	31.00 to 33.00
Malleable railroad, east. Pa.	32.00 to 34.00

(Net Tons)

Cast No. 1, Cleveland	24.50 to 25.50
Cast, No. 1, Chicago	23.00 to 24.00
Cast, No. 1, Cincinnati	23.00 to 23.50
Cast, No. 1, St. Louis	22.00 to 23.00
Malleable railroad, Chicago	28.00 to 29.00
Malleable railroad, St. Louis	26.00 to 27.00
Malleable agricultural, Chgo.	24.00 to 25.00

MISCELLANEOUS USES

(Gross Tons)

Reroll. rails, 5 ft. & ov., Pitts.	$45.00
Reroll. rails, 5 ft. & ov., Chgo.	34.00 to 35.00
Reroll. rails, 5 ft. & ov., E. Pa.	41.00 to 43.00
Reroll. rails, 5 ft. & ov., St. L.	40.00 to 42.00
Reroll. rails, 5 ft. or ov., Cleve.	38.00 to 39.00
Rerolling rails, long, Birming.	**37.50 to 38.50**

(Net Tons)

Boiler punchings, Chicago	33.50 to 34.50
Locomotive tires, Chicago	36.00 to 37.00
Locomotive tires, St. Louis	37.00 to 38.00